

CHAPTER 71POWER PLANTLIST OF EFFECTIVE PAGES

<u>CHAPTER/ SECTION</u>	<u>PAGE</u>	<u>DATE</u>	<u>CONFIG CODE</u>	<u>CHAPTER/ SECTION</u>	<u>PAGE</u>	<u>DATE</u>	<u>CONFIG CODE</u>
List of Effective Pages	1	Jun 15/96		71-DIAGM	13	Jun 15/95	
	2	Jun 15/96		71-DIAGM	14	Jun 15/95	
	3	Jun 15/96		71-DIAGM	15	Jun 15/95	
	4	Jun 15/96		71-DIAGM	16	Jun 15/95	
	5	Jun 15/96		71-DIAGM	17	Jun 15/95	
	6	Jun 15/96		71-DIAGM	18	Jun 15/95	
	7	Jun 15/96		71-DIAGM	19	Jun 15/95	
	8	Jun 15/96		71-DIAGM	20	Jun 15/95	
	9	Jun 15/96		71-DIAGM	21	Jun 15/95	
	10	Jun 15/96		71-DIAGM	22	Jun 15/95	
	11/12	Jun 15/96		71-DIAGM	23	Jun 15/95	
				71-DIAGM	24	Jun 15/95	
Table of Contents	1	Dec 15/94		71-INDEX	1	Aug 15/82	
	2	Dec 15/94		71-INDEX	2	Mar 15/83	
	3	Jun 15/92		71-INDEX	3	Jun 15/95	
	4	Jun 15/93		71-INDEX	4	Jun 15/95	
	5	Jun 15/94		71-INDEX	5	Jun 15/95	
	6	Nov 15/86		71-INDEX	6	Jun 15/95	
	7	Dec 15/93		71-INDEX	7	Jun 15/95	
	8	Nov 15/86		71-INDEX	8	Jun 15/95	
	9	Nov 15/86		71-INDEX	9	Jun 15/95	
	10	Nov 15/86		71-INDEX	10	Jun 15/95	
				71-INDEX	11	Jun 15/95	
71-contrs	1	Dec 15/93		71-INDEX	12	Jun 15/95	
71-contrs	2	Mar 15/91		71-INDEX	13	Jun 15/95	
71-contrs	3	Dec 15/95		71-INDEX	14	Jun 15/95	
71-contrs	4	Dec 15/95		71-INDEX	15	Jun 15/95	
71-contrs	5	Dec 15/95		71-INDEX	16	Jun 15/95	
71-contrs	6	Nov 15/81		71-INDEX	17	Jun 15/95	
71-contrs	7/8	Dec 15/94		71-INDEX	18	Jun 15/95	
71-DIAGM	1	Feb 15/82		71-INDEX	19	Jun 15/95	
71-DIAGM	2	Feb 15/82		71-INDEX	20	Jun 15/95	
71-DIAGM	3	Feb 15/82		71-INDEX	21	Jun 15/95	
71-DIAGM	4	May 15/82		71-INDEX	22	Jun 15/95	
71-DIAGM	5	Mar 15/83		71-INDEX	23	Jun 15/95	
71-DIAGM	6	Dec 15/91		71-INDEX	24	Jun 15/95	
71-DIAGM	7	Dec 15/91		71-INDEX	25	Jun 15/95	
71-DIAGM	8	Dec 15/91		71-INDEX	26	Jun 15/95	
71-DIAGM	9	Dec 15/91		71-00-00	1	Dec 15/80	
71-DIAGM	10	Dec 15/91		71-00-00	2	Dec 15/80	
71-DIAGM	11	Dec 15/91		71-00-00	3/4	Aug 15/81	
71-DIAGM	12	Dec 15/91		71-00-00	5/6	Aug 15/81	

List of Effective Pages
Page 1
Jun 15/96

LOCKHEED



MAINTENANCE MANUAL

CHAPTER 71

LIST OF EFFECTIVE TEMPORARY REVISIONS

FOLLOWING IS A COMPLETE LISTING OF ALL ACTIVE TEMPORARY REVISIONS (TR'S). TR'S NOT LISTED SHOULD BE REMOVED. THE ATA NUMBER, CONFIG CODE AND PAGE NUMBER IDENTIFIES THE PAGE PRECEDING THE TR.

TR NUMBER	ATA NUMBER	CONFIG CODE	PAGE NUMBER	TR DATE
--------------	---------------	----------------	----------------	------------

NONE



MAINTENANCE MANUAL

<u>CHAPTER/ SECTION</u>	<u>PAGE</u>	<u>DATE</u>	<u>CONFIG CODE</u>	<u>CHAPTER/ SECTION</u>	<u>PAGE</u>	<u>DATE</u>	<u>CONFIG CODE</u>
71-00-00	7	Dec 15/80		71-00-00	237	Jun 15/95	
71-00-00	8	May 15/78		71-00-00	238	Jun 15/95	
71-00-00	9	Aug 15/81		71-00-00	239	Jun 15/95	
71-00-00	10	Mar 15/83		71-00-00	240	Jun 15/95	
71-00-00	101	Mar 15/84		71-00-00	241	Jun 15/95	
71-00-00	102	Mar 15/84		71-00-00	242	Jun 15/95	
71-00-00	103	Mar 15/84		71-00-00	243/244	Jun 15/95	
71-00-00	104	Mar 15/84		71-00-00	501	Dec 15/91	
71-00-00	105	Mar 15/84		71-00-00	502	Dec 15/95	
71-00-00	106	Mar 15/84		71-00-00	503	Dec 15/95	
71-00-00	107	Mar 15/84		71-00-00	504	Dec 15/95	
71-00-00	108	Mar 15/84		71-00-00	505	May 15/86	
71-00-00	201	Jun 15/95		71-00-00	506	Mar 15/91	
71-00-00	202	Jun 15/95		71-00-00	507	Mar 15/91	
71-00-00	203	Jun 15/95		71-00-00	508	Mar 15/91	
71-00-00	204	Jun 15/95		71-00-00	509	Mar 15/91	
71-00-00	205	Jun 15/95		71-00-00	510	Mar 15/91	
71-00-00	206	Jun 15/95		71-00-00	511	Dec 15/95	
71-00-00	207	Dec 15/92		71-00-00	512	Dec 15/95	
71-00-00	208	Jun 15/95		71-00-00	513	Dec 15/95	
71-00-00	209	Jun 15/95		71-00-00	514	May 15/90	
71-00-00	210	Jun 15/95		71-00-00	515	Jun 15/92	
71-00-00	211	Jun 15/95		71-00-00	516	Dec 15/95	
71-00-00	212	Jun 15/95		71-00-00	517	Dec 15/95	
71-00-00	213	Jun 15/95		71-00-00	518	Dec 15/95	
71-00-00	214	Jun 15/95		71-00-00	519	May 15/90	
71-00-00	215	Jun 15/95		71-00-00	520	Dec 15/95	
71-00-00	216	Jun 15/95		71-00-00	521	Dec 15/95	
71-00-00	217	Jun 15/95		71-00-00	522	May 15/90	
71-00-00	218	Dec 15/95		71-00-00	523	May 15/90	
71-00-00	219	Jun 15/95		71-00-00	524	May 15/90	
71-00-00	220	Jun 15/95		71-00-00	525	May 15/90	
71-00-00	221	Jun 15/95		71-00-00	526	May 15/90	
71-00-00	222	Jun 15/95		71-00-00	527	May 15/90	
71-00-00	223	Jun 15/95		71-00-00	528	Mar 15/91	
71-00-00	224	Jun 15/95		71-00-00	529	May 15/90	
71-00-00	225	Jun 15/95		71-00-00	530	May 15/90	
71-00-00	226	Dec 15/95		71-00-00	531	May 15/90	
71-00-00	227	Jun 15/95		71-00-00	532	May 15/90	
71-00-00	228	Dec 15/95		71-00-00	533	Mar 15/91	
71-00-00	229	Jun 15/95		71-00-00	534	Dec 15/91	
71-00-00	230	Jun 15/95		71-00-00	535	Dec 15/91	
71-00-00	231	Jun 15/95		71-00-00	536	Dec 15/91	
71-00-00	232	Dec 15/95		71-00-00	537	Dec 15/91	
71-00-00	233	Jun 15/95		71-00-00	538	Jun 15/93	
71-00-00	234	Jun 15/95		71-00-00	539	Jun 15/93	
71-00-00	235	Jun 15/95		71-00-00	540	Dec 15/91	
71-00-00	236	Jun 15/95		R 71-00-00	541	Jun 15/96	



MAINTENANCE MANUAL

<u>CHAPTER/ SECTION</u>	<u>PAGE</u>	<u>DATE</u>	<u>CONFIG CODE</u>	<u>CHAPTER/ SECTION</u>	<u>PAGE</u>	<u>DATE</u>	<u>CONFIG CODE</u>
71-00-00	542	Dec 15/91		71-00-00	590	Dec 15/91	
71-00-00	543	Dec 15/91		71-00-00	591	Dec 15/91	
71-00-00	544	Dec 15/91		71-00-00	592	Dec 15/91	
71-00-00	545	Dec 15/91		71-00-00	593	Dec 15/91	
71-00-00	546	Dec 15/91		71-00-00	594	Dec 15/91	
71-00-00	547	Dec 15/91		71-00-00	595	Dec 15/91	
71-00-00	548	Dec 15/91		71-00-00	596	Dec 15/91	
71-00-00	549	Dec 15/91		71-00-00	597	Dec 15/91	
71-00-00	550	Dec 15/91		71-00-00	598	Dec 15/91	
71-00-00	551	Dec 15/91		R 71-00-00	599	Jun 15/96	
71-00-00	552	Dec 15/91		R 71-00-00	600	Jun 15/96	
71-00-00	553	Dec 15/91		R 71-00-00	601	Jun 15/96	
71-00-00	554	Dec 15/91		R 71-00-00	602	Jun 15/96	
71-00-00	555	Dec 15/91		R 71-00-00	603	Jun 15/96	
71-00-00	556	Dec 15/91		R 71-00-00	604	Jun 15/96	
71-00-00	557	Dec 15/91		R 71-00-00	605	Jun 15/96	
71-00-00	558	Dec 15/91		R 71-00-00	606	Jun 15/96	
71-00-00	559	Dec 15/91		R 71-00-00	607	Jun 15/96	
71-00-00	560	Dec 15/91		R 71-00-00	608	Jun 15/96	
71-00-00	561	Dec 15/91		R 71-00-00	609	Jun 15/96	
71-00-00	562	Dec 15/91		R 71-00-00	610	Jun 15/96	
71-00-00	563	Dec 15/91		71-00-00	601	Nov 15/86	
71-00-00	564	Dec 15/91		71-00-00	602	May 15/89	
71-00-00	565	Dec 15/91		71-00-00	603	Nov 15/85	
71-00-00	566	Dec 15/91		71-00-00	604	Mar 15/91	
71-00-00	567	Dec 15/91		71-00-00	605	Mar 15/91	
71-00-00	568	Dec 15/92		71-00-00	606	Mar 15/91	
71-00-00	569	Dec 15/91		71-00-00	607	Nov 15/85	
71-00-00	570	Dec 15/91		71-00-00	608	May 15/89	
71-00-00	571	Dec 15/91		71-00-00	609	May 15/87	
71-00-00	572	Dec 15/91		71-00-00	610	May 15/87	
71-00-00	573	Dec 15/91		71-00-00	701	Nov 15/85	
71-00-00	574	Dec 15/91		71-00-00	702	Nov 15/85	
71-00-00	575	Dec 15/91		71-00-00	703	Nov 15/85	
71-00-00	576	Dec 15/91		71-00-00	704	Jun 15/93	
71-00-00	577	Dec 15/91		71-00-00	705	Nov 15/85	
71-00-00	578	Dec 15/91		71-00-00	706	Nov 15/88	
71-00-00	579	Dec 15/91		71-00-00	707	Nov 15/85	
71-00-00	580	Dec 15/91		71-00-00	708	Nov 15/85	
71-00-00	581	Dec 15/91		71-00-00	709	Nov 15/85	
71-00-00	582	Dec 15/91		71-00-00	710	Nov 15/88	
71-00-00	583	Dec 15/91		71-00-00	711	Feb 15/82	
71-00-00	584	Dec 15/91		71-00-00	712	Feb 15/82	
71-00-00	585	Dec 15/91		71-00-00	713	Nov 15/85	
71-00-00	586	Dec 15/91		71-00-00	714	Feb 15/82	
71-00-00	587	Dec 15/91		71-00-00	715	Feb 15/82	
71-00-00	588	Dec 15/91		71-00-00	716	Feb 15/82	
71-00-00	589	Dec 15/91		71-00-00	717/718	Jun 15/93	



MAINTENANCE MANUAL

<u>CHAPTER/ SECTION</u>	<u>PAGE</u>	<u>DATE</u>	<u>CONFIG CODE</u>	<u>CHAPTER/ SECTION</u>	<u>PAGE</u>	<u>DATE</u>	<u>CONFIG CODE</u>
71-00-01	401	Dec 15/93		71-00-01	454	Nov 15/83	
71-00-01	402	Jun 15/93		71-00-01	455	Mar 15/83	
71-00-01	403	Jun 15/93		71-00-01	456	Mar 15/83	
R 71-00-01	404	Jun 15/96		71-00-01	457	Dec 15/91	
71-00-01	405/406	May 15/77		71-00-01	458	Dec 15/91	
71-00-01	407	May 15/77		71-00-01	459	Dec 15/91	
R 71-00-01	408	Jun 15/96		71-00-01	460	Dec 15/91	
71-00-01	409/410	Feb 15/79		71-00-01	461/462	Dec 15/91	
71-00-01	411	May 15/77		71-00-03	201/202	Nov 15/83	
71-00-01	412	May 15/77		71-00-03	401	Dec 15/93	
71-00-01	413	May 15/77		71-00-03	402	Jun 15/93	
71-00-01	414	May 15/77		71-00-03	403	Jun 15/93	
71-00-01	415	May 15/77		71-00-03	404	May 15/87	
71-00-01	416	Nov 15/81		71-00-03	405	May 15/87	
71-00-01	417	Jun 15/93		71-00-03	406	May 15/87	
71-00-01	418	Jun 15/93		71-00-03	407/408	May 15/77	
71-00-01	419/420	Jun 15/93		71-00-03	409	May 15/87	
71-00-01	421/422	Nov 15/81		71-00-03	410	May 15/87	
71-00-01	423	Nov 15/81		71-00-03	411	May 15/87	
71-00-01	424	Nov 15/81		71-00-03	412	Nov 15/82	
71-00-01	425	Nov 15/81		71-00-03	413	Nov 15/81	
71-00-01	426	Nov 15/81		71-00-03	414	Nov 15/81	
71-00-01	427	Nov 15/81		71-00-03	415	Nov 15/81	
71-00-01	428	Jun 15/93		71-00-03	416	Dec 15/93	
71-00-01	429/430	Nov 15/81		71-00-03	417	Aug 15/82	
71-00-01	431	Jun 15/93		71-00-03	418	Aug 15/82	
71-00-01	432	Nov 15/81		71-00-03	419	Nov 15/81	
71-00-01	433	Nov 15/81		71-00-03	420	Nov 15/81	
71-00-01	434	Jun 15/93		71-00-03	421	Nov 15/81	
71-00-01	435	Jun 15/93		71-00-03	422	May 15/87	
71-00-01	436	May 15/82		71-00-03	423	Dec 15/93	
71-00-01	437	May 15/82		71-00-03	424	May 15/87	
71-00-01	438	May 15/82		71-00-03	425/426	Nov 15/83	
71-00-01	439	Mar 15/83		71-00-03	427	Nov 15/83	
71-00-01	440	Mar 15/83		71-00-03	428	Nov 15/81	
71-00-01	441	May 15/82		71-00-03	429	Nov 15/81	
71-00-01	442	May 15/82		71-00-03	430	Nov 15/89	
71-00-01	443	May 15/90		71-00-03	431	Nov 15/89	
71-00-01	444	May 15/87		71-00-03	432	May 15/90	
R 71-00-01	445	Jun 15/96		71-00-03	433	May 15/87	
R 71-00-01	446	Jun 15/96		71-00-03	434	Aug 15/82	
71-00-01	447	May 15/82		71-00-03	435	May 15/85	
71-00-01	448	May 15/82		71-00-03	436	Aug 15/82	
71-00-01	449	May 15/82		71-00-03	437	May 15/85	
71-00-01	450	May 15/82		71-00-03	438	Jun 15/93	
71-00-01	451	Mar 15/83		71-00-03	439	Aug 15/82	
71-00-01	452	Nov 15/85		71-00-03	440	May 15/87	
71-00-01	453	Nov 15/85		71-00-03	441	Nov 15/87	

List of Effective Pages
Page 4
Jun 15/96



MAINTENANCE MANUAL

<u>CHAPTER/ SECTION</u>	<u>PAGE</u>	<u>DATE</u>	<u>CONFIG CODE</u>	<u>CHAPTER/ SECTION</u>	<u>PAGE</u>	<u>DATE</u>	<u>CONFIG CODE</u>
71-00-03	442	Nov 15/87		71-11-00	501	May 15/77	
71-00-03	443	Nov 15/87		71-11-00	502	May 15/77	
71-00-03	444	Nov 15/87		71-11-00	503/504	May 15/77	
71-00-03	445	Nov 15/87		71-11-00	801/802	May 15/77	
71-00-03	446	Nov 15/87		71-11-01	401	Dec 15/92	
71-00-03	447	Nov 15/87		71-11-01	402	Dec 15/92	
71-00-03	448	Nov 15/87		71-11-01	403	Dec 15/92	
71-00-03	449	Nov 15/87		71-11-01	404	Dec 15/92	
71-00-03	450	Nov 15/87		71-11-01	405	Dec 15/92	
71-00-03	451	May 15/90		71-11-01	406	Dec 15/79	
71-00-03	452	Nov 15/87		71-11-01	407	Dec 15/79	
71-00-03	453	Aug 15/82		71-11-01	408	Dec 15/92	
71-00-03	454	Nov 15/87		71-11-01	501	Mar 15/91	
71-00-03	455	Dec 15/91		71-11-01	502	Dec 15/79	
71-00-03	456	Dec 15/91		71-11-01	503	Dec 15/79	
71-00-03	457	Dec 15/91		71-11-01	504	Dec 15/79	
71-00-03	458	Dec 15/91		71-11-01	505	Mar 15/91	
71-00-03	459/460	Dec 15/91		71-11-01	506	Mar 15/91	
71-00-03	801	May 15/77		71-11-01	507/508	Mar 15/91	
71-00-03	802	Aug 15/81		71-11-01	601/602	Dec 15/80	
71-00-03	803/804	May 15/77		71-11-02	401/402	May 15/77	
71-00-06	401	Feb 15/82		71-11-02	501/502	Mar 15/91	
71-00-06	402	Feb 15/82		71-11-02	601/602	Dec 15/80	
71-00-06	403	Feb 15/82		71-11-03	401	Nov 15/86	
71-00-06	404	Feb 15/82		71-11-03	402	Nov 15/82	
71-00-06	405	Feb 15/82		71-11-03	403	Nov 15/86	
71-00-06	406	Feb 15/82		71-11-03	404	Nov 15/86	
71-00-06	407	Feb 15/82		71-11-03	405/406	Nov 15/89	
71-00-06	408	Feb 15/82		71-11-03	501	Jun 15/94	
71-00-06	409/410	Feb 15/82		71-11-03	502	Jun 15/92	
71-00-06	411/412	Feb 15/82		71-11-03	503/504	Jun 15/94	
71-00-06	413/414	Feb 15/82		71-11-03	701	Nov 15/86	
71-00-06	415/416	Feb 15/82		71-11-03	702	Nov 15/86	
71-11-00	1	Nov 15/81		71-11-03	703	May 15/77	
71-11-00	2	Nov 15/81		71-11-03	704	May 15/77	
71-11-00	3	May 15/77		71-11-03	705	Nov 15/86	
71-11-00	4	Nov 15/81		71-11-03	706	May 15/77	
71-11-00	5	May 15/77		71-11-03	707/708	Nov 15/86	
71-11-00	6	May 15/77		71-11-04	601/602	Dec 15/91	
71-11-00	7/8	May 15/77		71-12-00	1	May 15/77	
71-11-00	9/10	May 15/77		71-12-00	2	May 15/77	
71-11-00	301	May 15/88		71-12-00	3	Jun 15/80	
71-11-00	302	May 15/88		71-12-00	4	May 15/77	
71-11-00	303	Mar 15/83		71-12-00	5/6	May 15/77	
71-11-00	304	May 15/77		71-12-00	501	May 15/77	
71-11-00	305	May 15/77		71-12-00	502	Aug 15/81	
71-11-00	306	May 15/88		71-12-00	503/504	May 15/77	
71-11-00	307/308	May 15/88		71-12-00	601/602	Nov 15/83	

List of Effective Pages
Page 5
Jun 15/96



MAINTENANCE MANUAL

<u>CHAPTER/ SECTION</u>	<u>PAGE</u>	<u>DATE</u>	<u>CONFIG CODE</u>	<u>CHAPTER/ SECTION</u>	<u>PAGE</u>	<u>DATE</u>	<u>CONFIG CODE</u>
71-12-00	801/802	Nov 15/83		71-20-00	4	Jun 15/93	
71-12-01	301	May 15/90		71-20-00	5	May 15/77	
71-12-01	302	May 15/77		71-20-00	6	Jun 15/93	
71-12-01	303	Nov 15/78		71-20-00	7	Jun 15/93	
71-12-01	304	May 15/90		71-20-00	8	Jun 15/93	
71-12-01	401	Aug 15/81		71-20-00	9	Jun 15/93	
71-12-01	402	May 15/88		71-20-00	10	Jun 15/93	
71-12-01	403/404	May 15/77		71-20-01	601/602	May 15/77	
71-12-01	405/406	May 15/77		71-20-02	601	May 15/77	
71-12-01	407/408	May 15/77		71-20-02	602	May 15/77	
71-12-01	409	May 15/77		71-20-02	603/604	May 15/77	
71-12-01	410	May 15/88		71-20-06	401	Jun 15/93	
71-12-03	401	Aug 15/82		71-20-06	402	Jun 15/93	
71-12-03	402	Aug 15/82		71-30-00	1	Jun 15/79	
71-12-03	403	Aug 15/81		71-30-00	2	Jun 15/79	
71-12-03	404	Aug 15/82		71-30-00	3	Feb 15/78	
71-12-05	301	May 15/77		71-30-00	4	Jun 15/79	
71-12-05	302	Mar 15/80		71-30-00	5	Jun 15/79	
71-12-05	303/304	May 15/77		71-30-00	6	Jun 15/79	
71-12-05	401	Aug 15/81		71-30-01	401	Jun 15/94	1
71-12-05	402	Aug 15/81		71-30-01	402	Jun 15/94	1
71-12-05	403/404	May 15/77		71-30-01	403	Jun 15/94	1
71-12-05	405/406	May 15/77		71-30-01	404	Nov 15/81	1
71-12-05	407/408	May 15/77		71-30-01	405	Nov 15/81	1
71-12-05	409/410	Aug 15/81		71-30-01	406	Nov 15/81	1
71-12-05	411/412	May 15/77		71-30-01	407	Jun 15/94	1
71-12-07	401	Aug 15/81		71-30-01	408	Nov 15/81	1
71-12-07	402	Aug 15/81		71-30-01	409	Nov 15/81	1
71-12-07	403	Aug 15/81		71-30-01	410	Jun 15/94	1
71-12-07	404	May 15/77		71-30-01	411	Jun 15/94	1
71-12-07	405	May 15/77		71-30-01	412	Nov 15/81	1
71-12-07	406	Jun 15/94		71-30-01	413	Nov 15/81	1
71-12-07	407	Jun 15/94		71-30-01	414	Jun 15/94	1
71-12-07	408	Jun 15/94		71-30-01	415	Nov 15/81	1
71-12-07	409/410	Jun 15/94		71-30-01	416	Nov 15/81	1
71-12-07	411	Jun 15/94		71-30-01	417	Nov 15/81	1
71-12-07	412	Jun 15/94		71-30-01	418	Jun 15/94	1
71-12-07	413	Jun 15/94		71-30-01	419	Jun 15/94	1
71-12-07	414	Jun 15/94		71-30-01	420	Jun 15/94	1
71-12-07	415	Jun 15/94		71-30-01	421	Nov 15/81	1
71-12-07	416	Jun 15/94		71-30-01	422	Nov 15/81	1
71-12-07	601	Aug 15/81		71-30-01	423	Jun 15/94	1
71-12-07	602	Dec 15/80		71-30-01	424	Jun 15/94	1
71-12-07	603	Dec 15/80		71-30-01	425	Jun 15/94	1
71-12-07	604	Aug 15/81		71-30-01	426	Jun 15/94	1
71-20-00	1	Jun 15/93		71-30-01	427	Jun 15/94	1
71-20-00	2	Jun 15/93		71-30-01	428	Jun 15/94	1
71-20-00	3	May 15/77		71-30-01	429	Jun 15/94	1



MAINTENANCE MANUAL

<u>CHAPTER/ SECTION</u>	<u>PAGE</u>	<u>DATE</u>	<u>CONFIG CODE</u>	<u>CHAPTER/ SECTION</u>	<u>PAGE</u>	<u>DATE</u>	<u>CONFIG CODE</u>
71-30-01	430	Jun 15/94	1	71-30-01	602	May 15/82	
71-30-01	431	Jun 15/94	1	71-30-01	603	Nov 15/85	
71-30-01	432	Jun 15/94	1	71-30-01	604	May 15/82	
71-30-01	433	Jun 15/94	1	71-30-01	605	May 15/82	
71-30-01	434	Jun 15/94	1	71-30-01	606	May 15/82	
71-30-01	435	Jun 15/94	1	71-30-02	601/602	May 15/77	
71-30-01	436	Jun 15/94	1	71-30-03	601	Nov 15/77	
71-30-01	437	Jun 15/94	1	71-30-03	602	Nov 15/77	
71-30-01	438	Jun 15/94	1	71-50-00	1	Nov 15/87	
71-30-01	401	Jun 15/94	2	71-50-00	2	Nov 15/87	
71-30-01	402	Jun 15/94	2	71-50-00	3	Nov 15/87	
71-30-01	403	Jun 15/94	2	71-50-00	4	Nov 15/87	
71-30-01	404	Nov 15/81	2	71-50-00	5	Nov 15/81	
71-30-01	405	Nov 15/81	2	71-50-00	6	Nov 15/87	
71-30-01	406	Nov 15/81	2	71-50-00	7	Nov 15/81	
71-30-01	407	Jun 15/94	2	71-50-00	8	Feb 15/79	
71-30-01	408	Nov 15/81	2	71-50-00	9	Nov 15/87	
71-30-01	409	Nov 15/81	2	71-50-00	10	Nov 15/87	
71-30-01	410	Jun 15/94	2	71-50-00	11/12	Nov 15/87	
71-30-01	411	Nov 15/81	2	71-50-00	13/14	Nov 15/89	
71-30-01	412	Nov 15/81	2	71-50-00	15	Nov 15/87	
71-30-01	413	Jun 15/94	2	71-50-00	16	Nov 15/87	
71-30-01	414	Jun 15/94	2	71-50-00	17/18	Nov 15/87	
71-30-01	415	Nov 15/81	2	71-50-00	19/20	Nov 15/87	
71-30-01	416	Nov 15/81	2	71-50-00	21	Nov 15/87	
71-30-01	417	Nov 15/81	2	71-50-00	22	Nov 15/87	
71-30-01	418	Jun 15/94	2	71-50-00	23	Nov 15/87	
71-30-01	419	Jun 15/94	2	71-50-00	24	May 15/86	
71-30-01	420	Nov 15/81	2	71-50-00	25/26	Nov 15/87	
71-30-01	421	Nov 15/81	2	71-50-00	27	Feb 15/79	
71-30-01	422	Jun 15/94	2	71-50-00	28	Nov 15/87	
71-30-01	423	Jun 15/94	2	71-50-00	29	Nov 15/87	
71-30-01	424	Jun 15/94	2	71-50-00	30	Nov 15/87	
71-30-01	425	Jun 15/94	2	71-50-00	31/32	Feb 15/79	
71-30-01	426	Jun 15/94	2	71-50-00	33	Feb 15/79	
71-30-01	427	Jun 15/94	2	71-50-00	34	Feb 15/79	
71-30-01	428	Jun 15/94	2	71-50-00	35/36	Nov 15/87	
71-30-01	429	Jun 15/94	2	71-50-00	37	Feb 15/79	
71-30-01	430	Jun 15/94	2	71-50-00	38	Feb 15/79	
71-30-01	431	Jun 15/94	2	71-50-00	39/40	Nov 15/87	
71-30-01	432	Jun 15/94	2	71-50-00	41	Feb 15/79	
71-30-01	433	Jun 15/94	2	71-50-00	42	Feb 15/79	
71-30-01	434	Jun 15/94	2	71-50-00	43/44	Feb 15/79	
71-30-01	435	Jun 15/94	2	71-50-00	45/46	Nov 15/81	
71-30-01	436	Jun 15/94	2	71-50-00	47	Nov 15/87	
71-30-01	437	Jun 15/94	2	71-50-00	48	Feb 15/79	
71-30-01	438	Jun 15/94	2	71-50-00	49/50	Feb 15/79	
71-30-01	601	Nov 15/85		71-50-00	51	Feb 15/79	

List of Effective Pages

Page 7

Jun 15/96



MAINTENANCE MANUAL

<u>CHAPTER/ SECTION</u>	<u>PAGE</u>	<u>DATE</u>	<u>CONFIG CODE</u>	<u>CHAPTER/ SECTION</u>	<u>PAGE</u>	<u>DATE</u>	<u>CONFIG CODE</u>
71-50-00	52	Nov 15/87		71-50-00	116	Nov 15/89	
71-50-00	53/54	Nov 15/89		71-50-00	117/118	Nov 15/89	
71-50-00	55	Feb 15/79		71-50-00	119	Nov 15/89	
71-50-00	56	Nov 15/87		71-50-00	120	Nov 15/89	
71-50-00	57/58	Nov 15/81		71-50-00	121/122	Nov 15/89	
71-50-00	59	Nov 15/81		71-50-00	123	Nov 15/89	
71-50-00	60	Nov 15/87		71-50-00	124	Nov 15/89	
71-50-00	61/62	Nov 15/81		71-50-00	125/126	Nov 15/89	
71-50-00	63	Feb 15/79		71-50-00	127	Nov 15/89	
71-50-00	64	Nov 15/81		71-50-00	128	Nov 15/89	
71-50-00	65/66	Nov 15/87		71-50-00	129/130	Nov 15/89	
71-50-00	67	Feb 15/79		71-50-00	131	Nov 15/89	
71-50-00	68	Nov 15/81		71-50-00	132	Nov 15/89	
71-50-00	69/70	Nov 15/81		71-50-00	133/134	Nov 15/89	
71-50-00	71	Nov 15/81		71-50-00	135	Nov 15/89	
71-50-00	72	May 15/86		71-50-00	136	Nov 15/89	
71-50-00	73/74	May 15/86		71-50-00	137/138	Nov 15/89	
71-50-00	75	Feb 15/79		71-50-00	139	Nov 15/89	
71-50-00	76	Nov 15/81		71-50-00	140	Nov 15/89	
71-50-00	77/78	Nov 15/81		71-50-00	141/142	Nov 15/89	
71-50-00	79	Nov 15/81		71-50-00	143	Nov 15/89	
71-50-00	80	Nov 15/81		71-50-00	144	Nov 15/89	
71-50-00	81/82	Nov 15/81		71-50-00	145/146	Nov 15/89	
71-50-00	83	Feb 15/79		71-50-00	147	Nov 15/89	
71-50-00	84	Nov 15/81		71-50-00	148	Nov 15/89	
71-50-00	85/86	Nov 15/87		71-50-00	149/150	Nov 15/89	
71-50-00	87	Feb 15/79		71-50-00	151	Nov 15/89	
71-50-00	88	Nov 15/81		71-50-00	152	Nov 15/89	
71-50-00	89/90	Nov 15/87		71-50-00	153/154	Nov 15/89	
71-50-00	91	Feb 15/79		71-50-00	155	Nov 15/89	
71-50-00	92	Nov 15/81		71-50-00	156	Nov 15/89	
71-50-00	93/94	Nov 15/81		71-50-00	157/158	Nov 15/89	
71-50-00	95	Feb 15/79		71-50-00	159	Nov 15/89	
71-50-00	96	Nov 15/81		71-50-00	160	Nov 15/89	
71-50-00	97/98	Nov 15/81		71-50-00	161/162	Nov 15/89	
71-50-00	99	Nov 15/89		71-50-00	163	Nov 15/89	
71-50-00	100	Nov 15/89		71-50-00	164	Nov 15/89	
71-50-00	101/102	Nov 15/89		71-50-00	165/166	Nov 15/89	
71-50-00	103	Nov 15/89		71-50-00	167	Nov 15/89	
71-50-00	104	Nov 15/89		71-50-00	168	Nov 15/89	
71-50-00	105/106	Nov 15/89		71-50-00	169/170	Nov 15/89	
71-50-00	107	Nov 15/89		71-50-00	171	Nov 15/89	
71-50-00	108	Nov 15/89		71-50-00	172	Nov 15/89	
71-50-00	109/110	Nov 15/89		71-50-00	173/174	Nov 15/89	
71-50-00	111	Nov 15/89		71-50-01	401	Nov 15/87	
71-50-00	112	Nov 15/89		71-50-01	402	Nov 15/87	
71-50-00	113/114	Nov 15/89		71-50-01	403	Nov 15/87	
71-50-00	115	Nov 15/89		71-50-01	404	Nov 15/87	

List of Effective Pages

Page 8

Jun 15/96



MAINTENANCE MANUAL

<u>CHAPTER/ SECTION</u>	<u>PAGE</u>	<u>DATE</u>	<u>CONFIG CODE</u>	<u>CHAPTER/ SECTION</u>	<u>PAGE</u>	<u>DATE</u>	<u>CONFIG CODE</u>
71-50-01	405	Nov 15/87		71-70-00	202	May 15/88	
71-50-01	406	Aug 15/77		71-70-00	203	Aug 15/78	
71-50-01	407/408	Nov 15/87		71-70-00	204	May 15/88	
71-50-01	409	Nov 15/87		71-70-00	205	Dec 15/91	
71-50-01	410	Nov 15/87		71-70-00	206	Jun 15/96	
71-50-01	411	Nov 15/87		R 71-70-00	207/208	Jun 15/96	
71-50-01	412	Nov 15/87		R 71-70-00	207/208	Jun 15/96	
71-50-01	413/414	Nov 15/87		71-70-02	401	May 15/77	
71-50-01	501	Nov 15/87		71-70-02	402	May 15/77	
71-50-01	502	Nov 15/87		71-70-02	403	May 15/77	
71-50-01	503	Nov 15/87		71-70-02	404	May 15/77	
71-50-01	504	Nov 15/87		71-70-02	405	May 15/77	
71-50-01	505	Nov 15/87		71-70-02	406	May 15/77	
71-50-01	506	Nov 15/87		71-70-04	401	May 15/77	
71-50-01	507	Nov 15/87		71-70-04	402	May 15/77	
71-50-01	508	Nov 15/87		71-70-04	403/404	May 15/77	
71-50-01	509	Nov 15/87		71-70-05	401	May 15/88	
71-50-01	510	Nov 15/87		71-70-05	402	May 15/88	
71-50-01	511	Nov 15/87		71-70-05	403/404	May 15/88	
71-50-01	512	Nov 15/87		71-70-06	401	Dec 15/93	
71-50-01	513	May 15/89		71-70-06	402	Dec 15/93	
71-50-01	514	Nov 15/87		71-70-06	403	Dec 15/93	
71-50-01	515	Nov 15/87		71-70-06	404	Dec 15/93	
71-50-01	516	May 15/89		71-70-06	405/406	Dec 15/93	
71-50-01	517	May 15/89		71-70-06	601/602	Jun 15/95	
71-50-01	518	Nov 15/87		71-70-07	201	May 15/77	
71-50-01	519	Nov 15/87		71-70-07	202	May 15/77	
71-50-01	520	Nov 15/87		71-70-07	203	May 15/82	
71-50-01	521/522	May 15/89		71-70-07	204	May 15/77	
71-70-00	1	May 15/77		71-70-07	205	May 15/82	
71-70-00	2	May 15/77		71-70-07	206	May 15/77	
71-70-00	3	May 15/77		71-80-00	101	Mar 15/91	
71-70-00	4	May 15/77		71-80-00	102	Nov 15/87	
71-70-00	5	May 15/77		71-80-00	103	Nov 15/81	
71-70-00	6	May 15/77		71-80-00	104	Nov 15/81	
71-70-00	7	May 15/77		71-80-00	105	Nov 15/81	
71-70-00	8	May 15/77		71-80-00	106	Nov 15/81	
71-70-00	9	May 15/77		71-80-00	107	Nov 15/81	
71-70-00	10	May 15/77		71-80-00	108	Nov 15/81	
71-70-00	11	May 15/77		71-80-00	109	Nov 15/81	
71-70-00	12	May 15/77		71-80-00	110	Nov 15/81	
71-70-00	101	Nov 15/85		71-80-00	111	Nov 15/81	
71-70-00	102	Dec 15/93		71-80-00	112	Nov 15/87	
71-70-00	103	Dec 15/93		71-80-00	113	May 15/85	
71-70-00	104	Dec 15/93		71-80-00	114	Mar 15/91	
71-70-00	105	Dec 15/93		71-80-00	115	May 15/85	
71-70-00	106	Jun 15/94		71-80-00	116	Nov 15/87	
71-70-00	201	May 15/88		71-80-00	117	Nov 15/87	
				71-80-00	118	May 15/85	

List of Effective Pages

Page 9

Jun 15/96



MAINTENANCE MANUAL

<u>CHAPTER/ SECTION</u>	<u>PAGE</u>	<u>DATE</u>	<u>CONFIG CODE</u>	<u>CHAPTER/ SECTION</u>	<u>PAGE</u>	<u>DATE</u>	<u>CONFIG CODE</u>
71-80-00	119	May 15/85		71-84-00	113	Dec 15/91	
71-80-00	120	Jul 15/83		71-84-00	114	Dec 15/91	
71-80-00	121	May 15/85		71-84-00	115	Dec 15/91	
71-80-00	122	Jul 15/83		71-84-00	116	Dec 15/91	
71-80-00	123	May 15/85		71-84-00	117/118	Dec 15/91	
71-80-00	124	Mar 15/91		71-86-00	101	Dec 15/95	
71-81-00	101	Nov 15/87		71-86-00	102	May 15/86	
71-81-00	102	Nov 15/87		71-86-00	103	May 15/86	
71-81-00	103	Feb 15/82		71-86-00	104	Dec 15/91	
71-81-00	104	Feb 15/82		71-86-00	105	Dec 15/91	
71-81-00	105	Feb 15/82		71-86-00	106	Dec 15/91	
71-81-00	106	Feb 15/82		71-86-00	107	Dec 15/91	
71-81-00	107	Nov 15/87		71-86-00	108	Dec 15/91	
71-81-00	108	Nov 15/87		71-86-00	109	Dec 15/91	
71-82-00	101	Mar 15/91		71-86-00	110	Dec 15/91	
71-82-00	102	Mar 15/91		71-86-00	111	Dec 15/91	
71-82-00	103	Nov 15/81		71-86-00	112	Dec 15/91	
71-82-00	104	Nov 15/81		71-86-00	113	Dec 15/95	
71-82-00	105	Nov 15/81		71-86-00	114	Dec 15/95	
71-82-00	106	Nov 15/81		71-86-00	115	Dec 15/95	
71-82-00	107	Mar 15/91		71-86-00	116	Dec 15/95	
71-82-00	108	May 15/82		71-86-00	117/118	Dec 15/95	
71-82-00	109	Mar 15/83		71-88-00	101	May 15/87	
71-82-00	110	Mar 15/83		71-88-00	102	May 15/87	
71-83-00	101	Nov 15/87		71-88-00	103	Mar 15/81	
71-83-00	102	Nov 15/87		71-88-00	104	Mar 15/83	
71-83-00	103	Nov 15/81		71-88-00	105	Feb 15/82	
71-83-00	104	Nov 15/81		71-88-00	106	Jul 15/84	
71-83-00	105	Nov 15/81		71-88-00	107	Jul 15/84	
71-83-00	106	Nov 15/81		71-88-00	108	Feb 15/82	
71-83-00	107	Nov 15/87		71-88-00	109	Feb 15/82	
71-83-00	108	Nov 15/87		71-88-00	110	Mar 15/81	
71-83-00	109	Nov 15/87		71-88-00	111/112	May 15/87	
71-83-00	110	Nov 15/87		71-88-00	201/202	Nov 15/88	
71-83-00	111	Nov 15/87		71-89-00	101	May 15/87	
71-83-00	112	Nov 15/87		71-89-00	102	Mar 15/91	
71-84-00	101	Dec 15/91		71-89-00	103	May 15/87	
71-84-00	102	Dec 15/91		71-89-00	104	May 15/87	
71-84-00	103	Nov 15/81		71-89-00	105	Nov 15/89	
71-84-00	104	Nov 15/81		71-89-00	106	Nov 15/89	
71-84-00	105	Nov 15/81		71-89-00	107	Nov 15/89	
71-84-00	106	Nov 15/81		71-89-00	108	Nov 15/89	
71-84-00	107	May 15/85		71-89-00	109	Nov 15/89	
71-84-00	108	Nov 15/83		71-89-00	110	Nov 15/89	
71-84-00	109	May 15/85		71-89-00	111	Nov 15/89	
71-84-00	110	May 15/82		71-89-00	112	Nov 15/89	
71-84-00	111	May 15/85		71-89-00	113	Nov 15/89	
71-84-00	112	May 15/85		71-89-00	114	Nov 15/89	

List of Effective Pages

Page 10

Jun 15/96

LOCKHEED



MAINTENANCE MANUAL

<u>CHAPTER/ SECTION</u>	<u>PAGE</u>	<u>DATE</u>	<u>CONFIG CODE</u>	<u>CHAPTER/ SECTION</u>	<u>PAGE</u>	<u>DATE</u>	<u>CONFIG CODE</u>
71-89-00	115	Nov 15/89					
71-89-00	116	Nov 15/89					
71-89-00	117	Mar 15/91					
71-89-00	118	Mar 15/91					
71-91-00	101	Mar 15/91					
71-91-00	102	May 15/90					
71-91-00	103	Mar 15/81					
71-91-00	104	Mar 15/81					
71-91-00	105	Dec 15/91					
71-91-00	106	Dec 15/91					
71-91-00	107	Dec 15/91					
71-91-00	108	Jun 15/93					
71-91-00	109/110	Jun 15/93					
71-93-00	101	Nov 15/85					
71-93-00	102	Nov 15/85					
71-93-00	103/104	Nov 15/85					
71-95-00	101	Jul 15/84					
71-95-00	102	Jul 15/84					
71-99-00	101	Jun 15/92					
71-99-00	102	Jun 15/92					
71-99-00	103	Jun 15/94					
71-99-00	104	Jun 15/92					
71-99-00	105	Jun 15/94					
71-99-00	106	Jun 15/92					
71-99-00	107	Jun 15/94					
71-99-00	108	Jun 15/94					
71-99-00	109	Jun 15/94					
71-99-00	110	Jun 15/92					

LOCKHEED
MAINTENANCE MANUAL

CHAPTER 71

POWER PLANT

TABLE OF CONTENTS

Subject		Chapter Section Subject	Page	Effec- tivity
<u>INDEX</u>		71-INDEX		
C	FIRM Fault Code Cross Reference		1	ALL
<u>POWER PLANT</u>		71-00-00		
R	Description and Operation		1	ALL
R	Fault Isolation		101	ALL
R	Maintenance Practices		201	CONFIG 1 RB.211- 22B
R	Maintenance Practices		201	CONFIG 2 RB.211- 524
R	Adjustment/Test		501	ALL
R	Inspection/Check		601	ALL
R	Cleaning, Painting and Preservation		701	ALL

71-CONTENTS

Page 1
Dec 15/94

LOCKHEED



MAINTENANCE MANUAL

Subject	Chapter Section Subject	Page	Effect- tivity
<u>POWER PLANT</u>	71-00-00		
QEC UNIT - WING MOUNTED (ENGINE NO. 1 AND NO. 3) Removal/Installation	71-00-01	401	ALL
QEC UNIT - FUSELAGE-MOUNTED (ENGINE NO. 2) Maintenance Practices Removal/Installation Approved Repairs	71-00-03	201 401 801	ALL ALL ALL
R RB211-22B-02/RB211-524B-02 CONVERSION/RECONVERSION Removal/Installation	71-00-06	401	032, 033



Subject	Chapter Section Subject	Page	Effec- tivity
<u>COWLING</u>	71-10-00		
COWLING ENGINES NO. 1 AND NO. 3	71-11-00		
Description and Operation		1	ALL
Servicing		301	ALL
Adjustment/Test		501	ALL
Approved Repairs		801	ALL
HINGED COWL - LEFT HAND	71-11-01		
Removal/Installation		401	ALL
Adjustment/Test		501	ALL
Inspection/Check		601	ALL
HINGED COWL - RIGHT HAND	71-11-02		
Removal/Installation		401	ALL
Adjustment/Test		501	ALL
Inspection/Check		601	ALL
COWL - NOSE	71-11-03		
Removal/Installation		401	ALL
Adjustment/Test		501	ALL
Cleaning/Painting		701	ALL
ENGINE NO. 2 COWLING	71-12-00		
Description and Operation		1	ALL
Adjustment/Test		501	ALL
Inspection/Check		601	ALL
HINGED COWL - LH AND RH LOWER	71-12-01		
Servicing		301	ALL
Removal/Installation		401	ALL
FIXED COWL - LH AND RH MID	71-12-03		
Removal/Installation		401	ALL
HINGED COWLS - LH AND RH UPPER	71-12-05		
Servicing		301	ALL
Removal/Installation		401	ALL
ADAPTER - AIR INTAKE	71-12-07		
Removal/Installation		401	ALL
Inspection/Check		601	ALL



Subject	Chapter Section Subject	Page	Effec- tivity
<u>MOUNTS</u>	71-20-00		
Description and Operation		1	ALL
MOUNT - ENGINE FRONT	71-20-01		
Inspection/Check		601	ALL
MOUNT - ENGINE REAR	71-20-02		
Inspection/Check		601	ALL
SPIDER - ENGINE NO. 2 FRONT MOUNT	71-20-06		
R Removal/Installation		401	001-014

LOCKHEED



MAINTENANCE MANUAL

Subject	Chapter Section Subject	Page	Effec- tivity
<u>FIRESEALS</u>	71-30-00		
Description and Operation		1	ALL
FIREWALL - ENGINE	71-30-01		
Removal/Installation		401	ALL
Inspection/Check		601	ALL
EXTENSION - ENGINE FIREWALL, (ENGINE			
NO. 2)	71-30-02		
Inspection/Check		601	ALL
ENGINE FIRESEAL	71-30-03		
Inspection/Check		601	ALL

LOCKHEED



MAINTENANCE MANUAL

Subject	Chapter Section Subject	Page	Effec tivity
<u>ELECTRICAL HARNESS</u>	71-50-00		
R Description and Operation HARNESS - ELECTRICAL, LIGHT DUTY, ENGINE		1	ALL
Removal/Installation Adjustment/Test	71-50-01	401 501	ALL ALL

71-CONTENTS

Page 6

Nov 15/86

050B

LOCKHEED



MAINTENANCE MANUAL

Subject	Chapter Section Subject	Page	Effec- tivity
<u>ENGINE DRAINS</u>	71-70-00		
Description and Operation		1	ALL
Fault Isolation		101	ALL
Maintenance Practices		201	ALL
ENGINE MOUNTED TUBES	71-70-02		
Removal/Installation		401	ALL
VENT LINE TUBES - ENGINE NO. 2 TANK			
OVERBOARD DRAINS	71-70-04		
Removal/Installation		401	001-014
OVERBOARD DUCTING - ENGINE NO. 2			
GEARBOX BREATHER	71-70-05		
Removal/Installation		401	ALL
R FUEL DRAIN TANK	71-70-06		
R Removal/Installation		401	ALL
R Inspection/Check		601	ALL
COMBINATION FLOAT/EJECTOR VALVE	71-70-07		
Maintenance Practices		201	ALL

71-CONTENTS

Page 7

Dec 15/93

LOCKHEED



MAINTENANCE MANUAL

Subject	Chapter Section Subject	Page	Effec- tivity
R <u>LOW POWER</u>	71-80-00		
HIGH POWER Fault Isolation	71-81-00	101	ALL
FLUCTUATING POWER Fault Isolation	71-82-00	101	ALL
THROTTLE LEVER STAGGER Fault Isolation	71-83-00	101	ALL
ACCELERATION, DECELERATION AND IDLE Fault Isolation	71-84-00	101	ALL

LOCKHEED



MAINTENANCE MANUAL

Subject		Chapter Section Subject	Page	Effec- tivity
<u>LOW POWER (CONT)</u>		71-80-00		
SHAFT SPEED Fault Isolation		71-86-00	101	ALL
TURBINE GAS TEMPERATURE (STARTING AND RELIGHTING) Fault Isolation		71-88-00	101	ALL
R	TURBINE GAS TEMPERATURE			
R	(NOT STARTING AND RELIGHTING) Fault Isolation	71-89-00	101	ALL



Subject		Chapter Section Subject	Page	Effec- tivity
<u>MISCELLANEOUS</u>		71-90-00		
R	VIBRATION	71-91-00		
	Fault Isolation		101	ALL
	<u>SURGE</u>	71-93-00		
	Fault Isolation		101	ALL
	ENGINE TURBINE COOLING AIR	71-95-00		
	Fault Isolation		101	ALL
R	MISCELLANEOUS	71-99-00		
	Fault Isolation		101	ALL

CHAPTER 71-POWER PLANTTABLE OF CONTENTS

<u>Subject</u>	<u>Chapter/ Section Subject</u>	<u>Page</u>
<u>FAULT CODE DIAGRAMS</u>		1
<u>FAULT CODE INDEX</u>		1
<u>CHAPTER 71 POWER PLANT</u>	71-00-00	
GENERAL		101
SPECIAL INCIDENT INSPECTION		101
TROUBLE SHOOTING PROCEDURE		102
TROUBLE SHOOTING CHARTS		102
Forward Electronic Service Compartment		103
AIDS Control Unit		107
CEU Front Panel		108
<u>ENGINE DRAINS</u>	71-70-00	
GENERAL		101
FAULT ISOLATION/IDENTIFICATION		101
R Fuel leakage from drains fairing (Pre		
R S.B.71-2831)		102
R Fuel leakage from drains fairing		
R (S.B.71-2831)		104
R Restricted/no fuel flow from turbine case		
R drain following an aborted wet start		106
<u>LOW POWER - FAULT ISOLATION 1.</u>	71-80-00	
GENERAL		101
FAULT ISOLATION/IDENTIFICATION		101
Component Locator Diagram		103
Low power/E.P.R. shortfall - all other		
indications low - throttle limited		113
Low power - N2 limited		115
E.P.R. indication low/zero - all other		
indications normal		116

EFFECTIVITY: ALL

		Chapter/ Section	
<u>Subject</u>		<u>Subject</u>	<u>Page</u>
<u>LOW POWER - FAULT ISOLATION 1. (CONT)</u>		71-80-00	
Low power - T.G.T. high - other parameters normal			118
Engine run down with possible flame-out or No response to throttle lever movement			120
Engine flame-out			122
Auto-deceleration at constant power setting			124
<u>HIGH POWER - FAULT ISOLATION 1.</u>		71-81-00	
GENERAL			101
FAULT ISOLATION/IDENTIFICATION			101
Component Locator Diagram			103
High indicated E.P.R. - all other parameters normal			107
High power - all other indications high			108
<u>FLUCTUATING POWER - FAULT ISOLATION 1.</u>		71-82-00	
GENERAL			101
FAULT ISOLATION/IDENTIFICATION			101
Component Locator Diagram			103
R Fluctuating power (all parameters) at constant throttle setting			107
R E.P.R. indication fluctuates - all other indications normal			109
Engine oscillates with or without fluctuating parameters (pod nod)			110
<u>THROTTLE LEVER STAGGER - FAULT ISOLATION 1.</u>		71-83-00	
GENERAL			101
FAULT ISOLATION/IDENTIFICATION			101
Component Locator Diagram			103
Throttle stagger owing to high E.P.R. reading - all other parameters normal			107
Throttle stagger owing to low E.P.R. reading - all other parameters normal			108
Throttle stagger - one throttle leads			111
Throttle stagger - one throttle lags			112

EFFECTIVITY: ALL

71-FI CONTENTS

Page 2
Mar 15/91

<u>Subject</u>	<u>Chapter/ Section Subject</u>	<u>Page</u>
<u>ACCELERATION, DECELERATION AND IDLE - FAULT ISOLATION 1.</u>	71-84-00	
GENERAL		101
FAULT ISOLATION/IDENTIFICATION		101
Component Locator Diagram		103
Engine slow to accelerate - ground idle normal		107
Engine slow to accelerate - ground idle high		108
No response to throttle lever movement		110
Engine high/low ground idle		111
Engine rundown following deceleration Engines without S.B.71-5474		113
Engine rundown following deceleration Engines with S.B.71-5474		114
Engine rundown to sub-idle following initial normal acceleration from ground idle - Engines with SB 71-5474		115
Engine rundown from ground idle Engines with S.B.71-5474		116
<u>SHAFT SPEED FAULTS</u>	71-86-00	
GENERAL		101
FAULT ISOLATION/IDENTIFICATION		101
N2 trend high/low		104
High N2 up to and including 102.5%		106
N2 overspeed above 102.5% up to and including 106%		108
N2 overspeed above 106% up to and including 115%		109
N2 overspeed above 115%		112
R N1 overspeed above 101% up to and including		
R 103%		114
<u>TURBINE GAS TEMPERATURE (STARTING AND RELIGHTING) -</u>	71-88-00	
GENERAL		101
FAULT ISOLATION/IDENTIFICATION		101
Component Locator Diagram		103
Engine lights-up, but maximum T.G.T. appears likely to be exceeded below 32% N3		104
Engine lights-up, but maximum T.G.T. appears likely to be exceeded above 32% N3		106

EFFECTIVITY: ALL

<u>Subject</u>	<u>Chapter/ Section Subject</u>	<u>Page</u>
<u>TURBINE GAS TEMPERATURE (STARTING AND RELIGHTING) - (CONT)</u>	71-88-00	
Engine overtemperature above 550 deg.C. up to and including 600 deg.C.		108
Engine overtemperature above 600 deg.C. up to and including 725 deg.C.		110
Engine overtemperature above 725 deg.C.		111/112
<u>TURBINE GAS TEMPERATURE (NOT STARTING AND RELIGHTING) -</u>	71-89-00	
GENERAL		101
FAULT ISOLATION/IDENTIFICATION		101
Component Locator Diagram		104
Engine overtemperature above 700 deg.C. up to and including 710 deg.C.		105
Engine overtemperature above 710 deg.C. up to and including 728 deg.C.		106
Engine overtemperature above 728 deg.C. up to and including 738 deg.C.		108
Engine overtemperature above 738 deg.C. up to and including 743 deg.C.		109
Engine overtemperature above 743 deg.C. up to and including 750 deg.C.		110
Engine overtemperature above 750 deg.C. up to and including 780 deg.C.		112
Engine overtemperature above 780 deg.C.		114
T.G.T. indication reads low/zero		115
High T.G.T. - all other indications normal		116
High T.G.T. and fuel flow at an E.P.R.		118
<u>VIBRATION - FAULT ISOLATION 1.</u>	71-91-00	
GENERAL		101
FAULT ISOLATION/IDENTIFICATION		101
Component Locator Diagram		103
High indicated vibration		106
Excessive L.P. compressor noise (Excessive aft cabin noise)		109/110

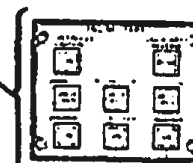
<u>Subject</u>	<u>Chapter/ Section Subject</u>	<u>Page</u>
<u>SURGE - FAULT ISOLATION 1.</u>	71-93-00	
GENERAL		101
FAULT ISOLATION/IDENTIFICATION		101
Take-off surge		102
Engine surge in flight		103/104
<u>ENGINE TURBINE COOLING AIR</u>	71-95-00	
GENERAL		101
FAULT ISOLATION/IDENTIFICATION		101
Engine turbine cooling air overheat warning light ON		102
<u>MISCELLANEOUS FAULTS - FAULT ISOLATION 1.</u>	71-99-00	
GENERAL		101
FAULT ISOLATION/IDENTIFICATION		101
Bird strike/suspected bird strike, no other indication of engine malfunction - engine did not surge		103
Bird strike/suspected bird strike, with other indications of engine malfunction - engine did not surge		105
Bird strike/suspected bird strike, accompanied by engine surge.		107
Bird strike/suspected bird strike, accompanied by engine surge and with other indications of engine malfunction		109
Nose Cowl - Thermal Anti-icing Blow-out door found open after flight or following engine ground running		110

R
R
50B EFFECTIVITY: ALL

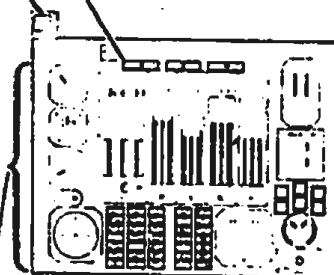
<u>TITLE</u>	<u>CHAP/SEC</u>
DECREASE/FLUCTUATION OF POWER.	7100
ENGINE FLAMEOUT	7100
ENG 2 FAIL LIGHT	7714
EPR INDICATOR.	7711
FAILURE TO RELIGHT/REACH IDLE-- STARTER ASSIST	7100
FAILURE TO RELIGHT/REACH IDLE-- WINDMILLING	7100
FF/FUEL USED INDICATOR.	7334
GROUND START VALVE OPEN LIGHT	8011
IN-FLIGHT SURGE	7100
N1 INDICATOR.	7712
N3 INDICATOR.	7712
OVERTEMPERATURE (EXCEPT STARTING).	7100
OVERTEMPERATURE (STARTING AND RELIGHTING).	7100
POSSIBLE OVERTEMPERATURE/HIGH TEMPERATURE	7100
REVERSE THRUST	
REVERSE THRUST SELECTED.	7800
REVERSE THRUST CANCELLED	7800
IN FLIGHT	7800
STARTING	7100
TAKE-OFF SURGE.	7100
TGT INDICATOR.	7721
THROTTLE STAGGER	7100

POWER PLANT CONTENTS

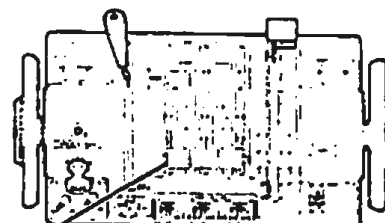
GROUND START VALVE
OPEN LIGHT
STARTING
FAILURE TO
RELIGHT/REACH IDLE--
WINDMILLING
FAILURE TO
RELIGHT/REACH IDLE--
STARTER ASSIST
REVERSE THRUST
REVERSE THRUST
SELECTED
REVERSE THRUST
CANCELLED
IN FLIGHT
ENG 2 FAIL LIGHT
STARTING
POSSIBLE
OVERTEMPERATURE/HIGH
TEMPERATURE
DECREASE/FLUCTUATION
OF POWER
ENGINE FLAMEOUT
TAKE-OFF SURGE
IN-FLIGHT SURGE
FAILURE TO
RELIGHT/REACH IDLE--
WINDMILLING
FAILURE TO
RELIGHT/REACH IDLE--
STARTER ASSIST
EPR INDICATOR
FF/FUEL USED
INDICATOR
N1 INDICATOR
N3 INDICATOR
TGT INDICATOR
OVERTEMPERATURE
(EXCEPT STARTING)
OVERTEMPERATURE
(STARTING AND
RELIGHTING)
DECREASE/FLUCTUATION
OF POWER
THROTTLE STAGGER



(CENTER CONSOLE)



(CENTER INSTRUMENT PANEL)



(PILOTS OVERHEAD PANEL)

M1-0001-71-8504

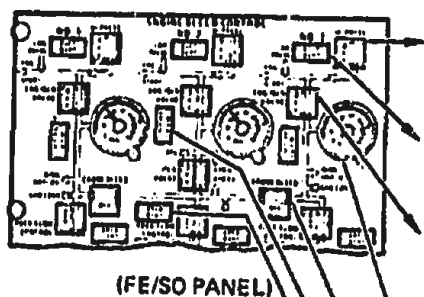
POWERPLANT CONTENTS

71-FI CONTENTS

Page 6
Nov 15/81

R
R
001B

EFFECTIVITY: ALL



(FE/SO PANEL)

POWERPLANT CONTENTS

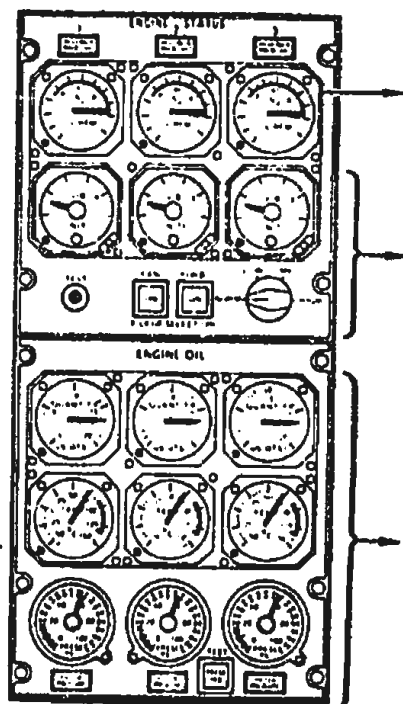
CROSSBLEED START
ENGINE BLEED AIR
NACELLE/PYLON
OVERHEAT DETECTION

DUCT OVHT, ENGINE
(1, 2, OR 3)

GROUND START VALVE
OPEN LIGHT
ENGINE BLEED AIR

CROSSBLEED START
POSSIBLE
OVERTEMPERATURE/HIGH
TEMPERATURE
ENGINE BLEED AIR

CROSSBLEED START
AREA OVHT, BLEED AIR
(J)
AREA OVERHEAT TEST
AREA OVHT, BLEED AIR
(D, E, OR H)



(FE/SO PANEL)

STARTING

AIRBORNE VIBRATION
MONITOR
N2 OVERSPEED
N2 INDICATOR

ABNORMAL OIL SYSTEM
INDICATIONS
RISE IN FUEL/OIL
TEMPERATURE
STARTING
OIL PRESSURE LOW/HIGH
OIL FILTER PRESSURE
LIGHT
ENGINE FLAMEOUT

TITLE	CHAP/SEC
ABNORMAL OIL SYSTEM INDICATIONS	7900
AIRBORNE VIBRATION MONITOR	7731
AREA OVERHEAT TEST	3600
AREA OVHT, BLEED AIR (D, E, OR H)	3600
AREA OVHT, BLEED AIR (J)	3600
CROSSBLEED START	3600
DUCT OVHT, ENGINE (1, 2, OR 3)	3600
ENGINE BLEED AIR	3600
ENGINE FLAMEOUT	7100
GROUND START VALVE OPEN LIGHT	8011
NACELLE/PYLON OVERHEAT DETECTION	2600
N2 INDICATOR	7712
N2 OVERSPEED	7100
OIL FILTER PRESSURE LIGHT	7900
OIL PRESSURE LOW/HIGH	7900
POSSIBLE OVERTEMPERATURE/HIGH TEMPERATURE	7100
RISE IN FUEL/OIL TEMPERATURE	7337
STARTING	7100

M1-0002-71-8505

R

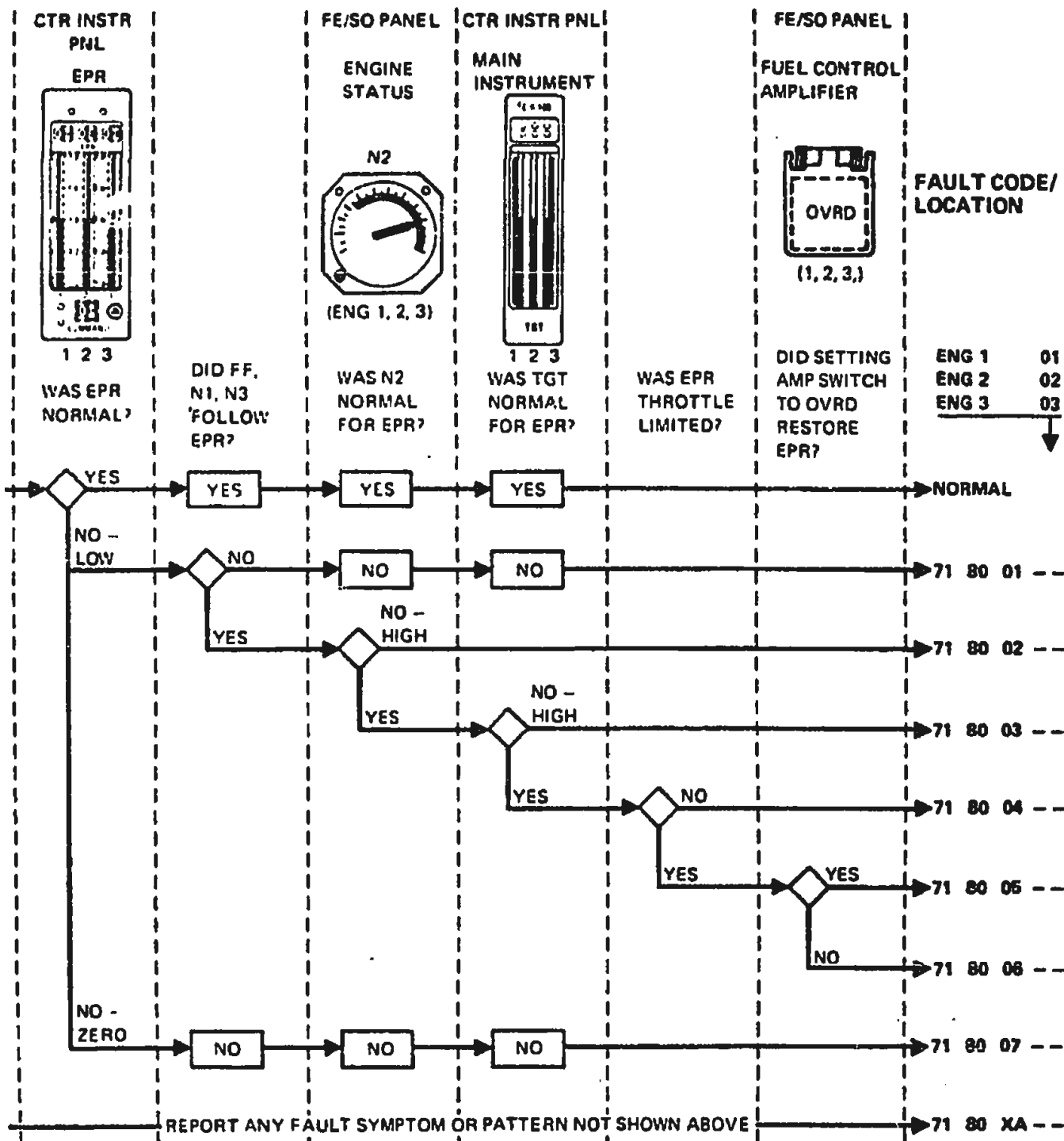
POWERPLANT CONTENTS

EFFECTIVITY: ALL

71-FI CONTENTS

Page 7/8
Dec 15/94

001B



EDJ-0000-71-1001

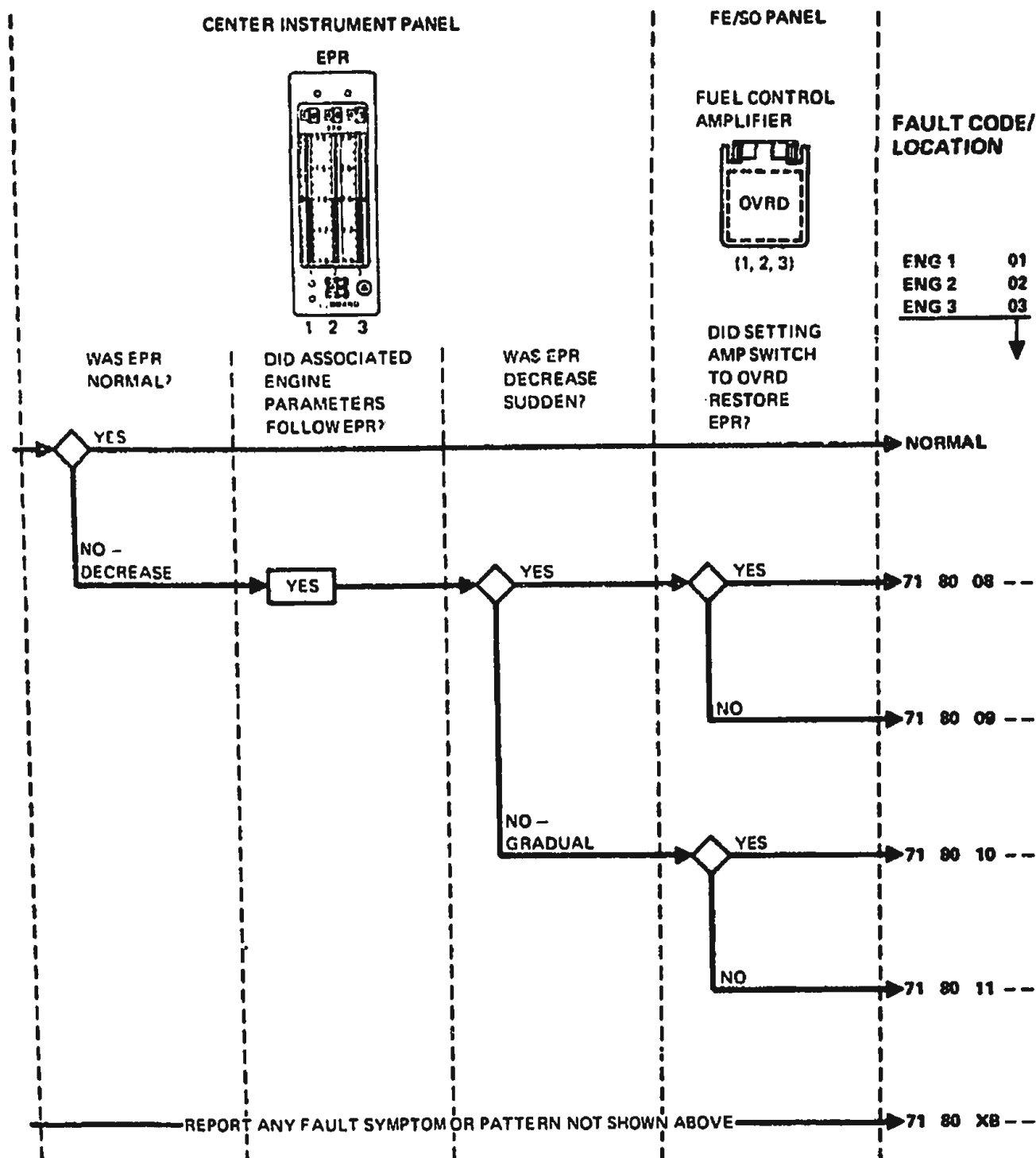
Low Power - Fault Codes

EFFECTIVITY: ALL

71-FAULT CODE DIAGRAM

Page 1
Feb 15/82

0508



ED1-0000-71-1003

R

Decrease In Power - Fault Codes
Figure 2

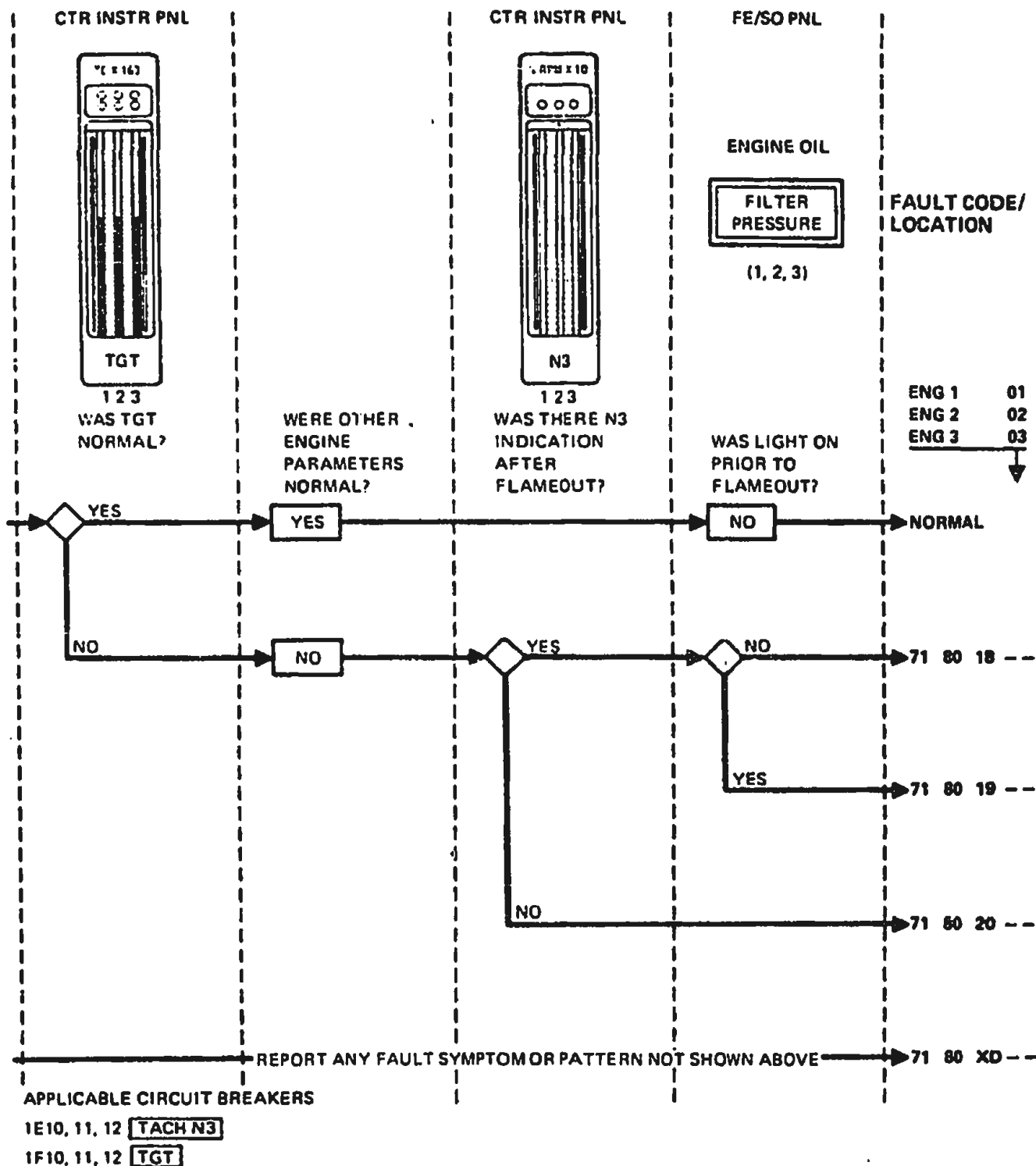
R

EFFECTIVITY: ALL

71-FAULT CODE DIAGRAM

Page 2
Feb 15/82

050B



ED1-0000-71-1007

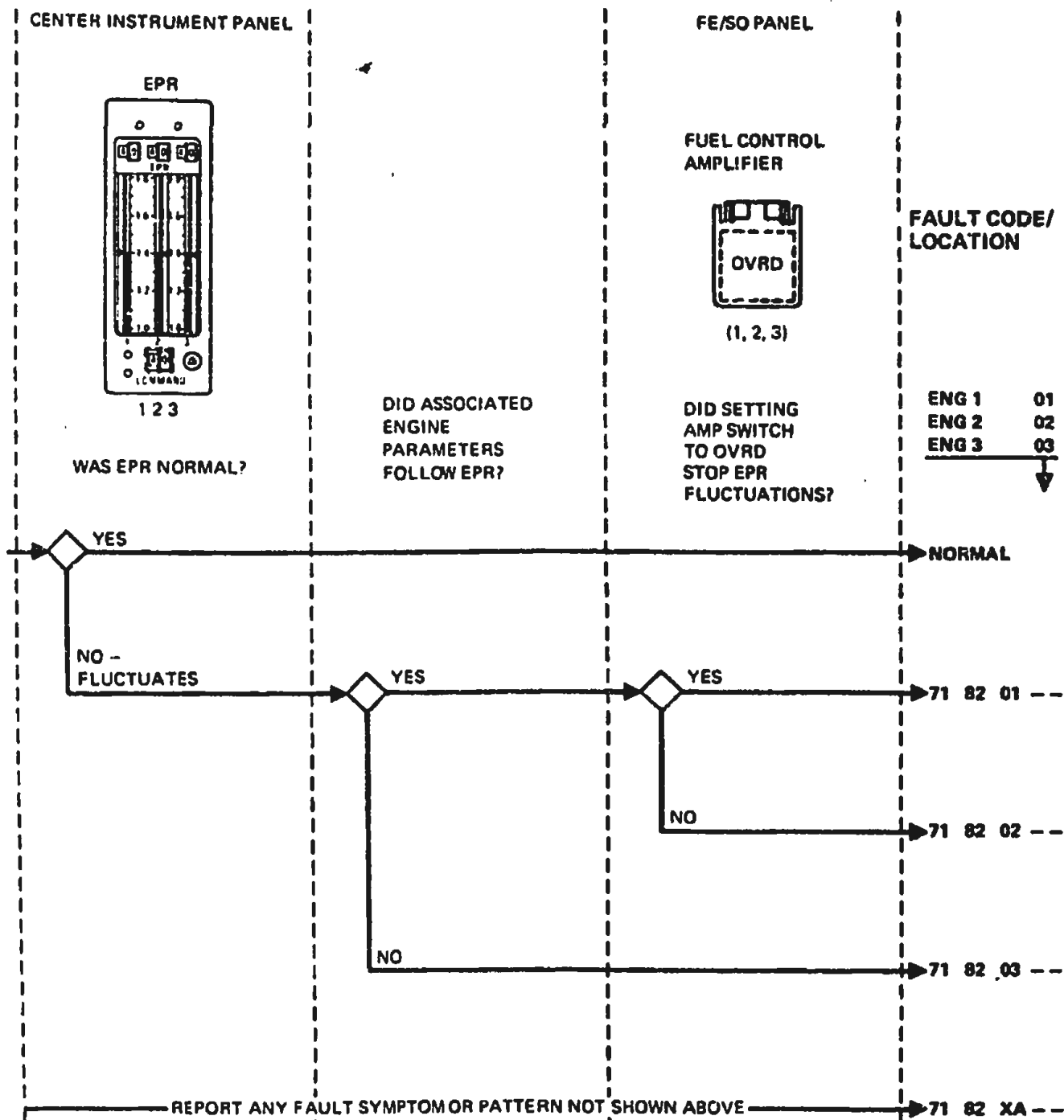
R Engine Flameout - Fault Codes
Figure 3

R EFFECTIVITY: ALL

71-FAULT CODE DIAGRAM

Page 3
Feb 15/82

050B



EO1-0001-71-1011

R

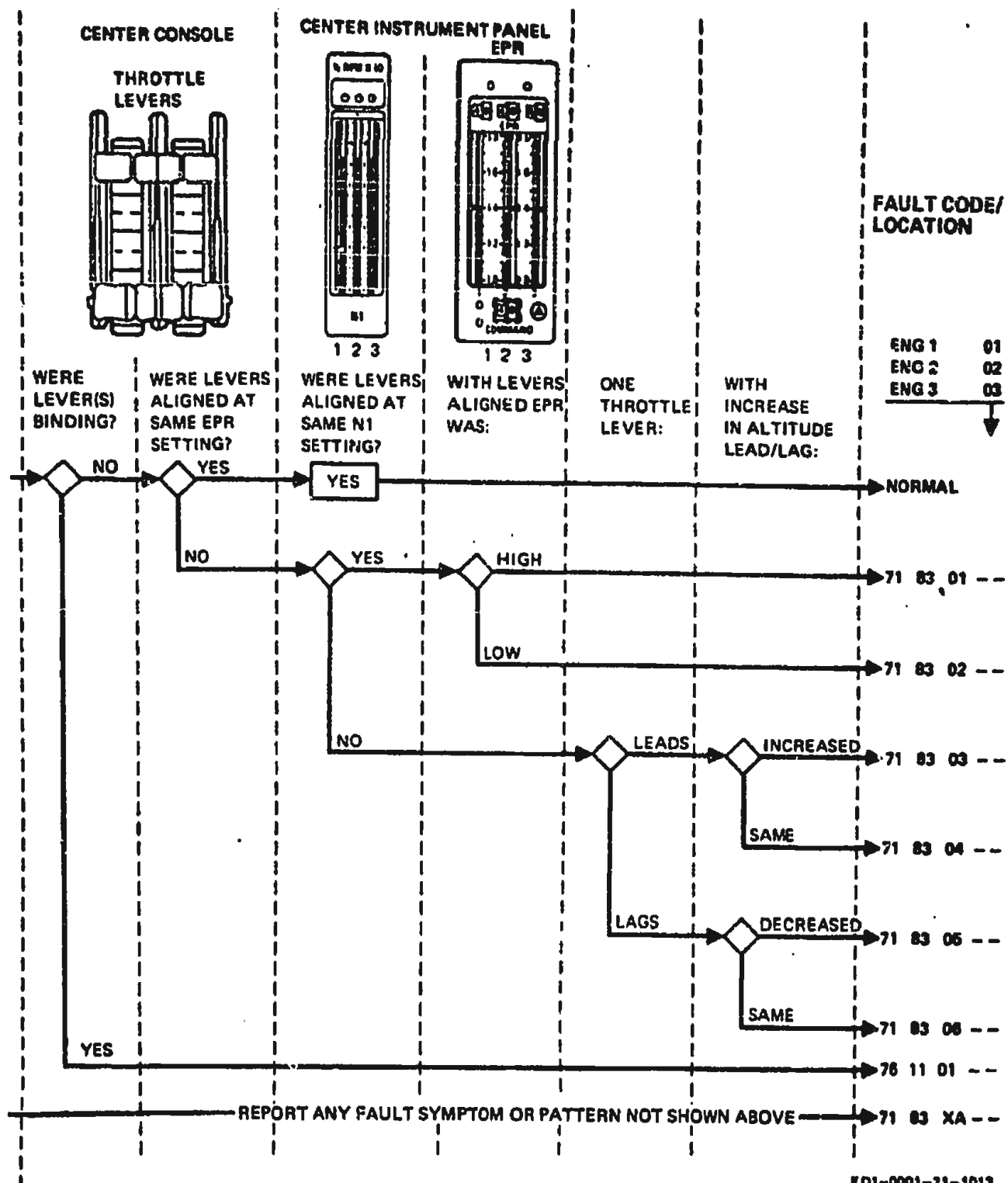
Fluctuating Power - Fault Codes
Figure 4

EFFECTIVITY: ALL

71-FAULT CODE DIAGRAM

Page 4
May 15/82

050B



R

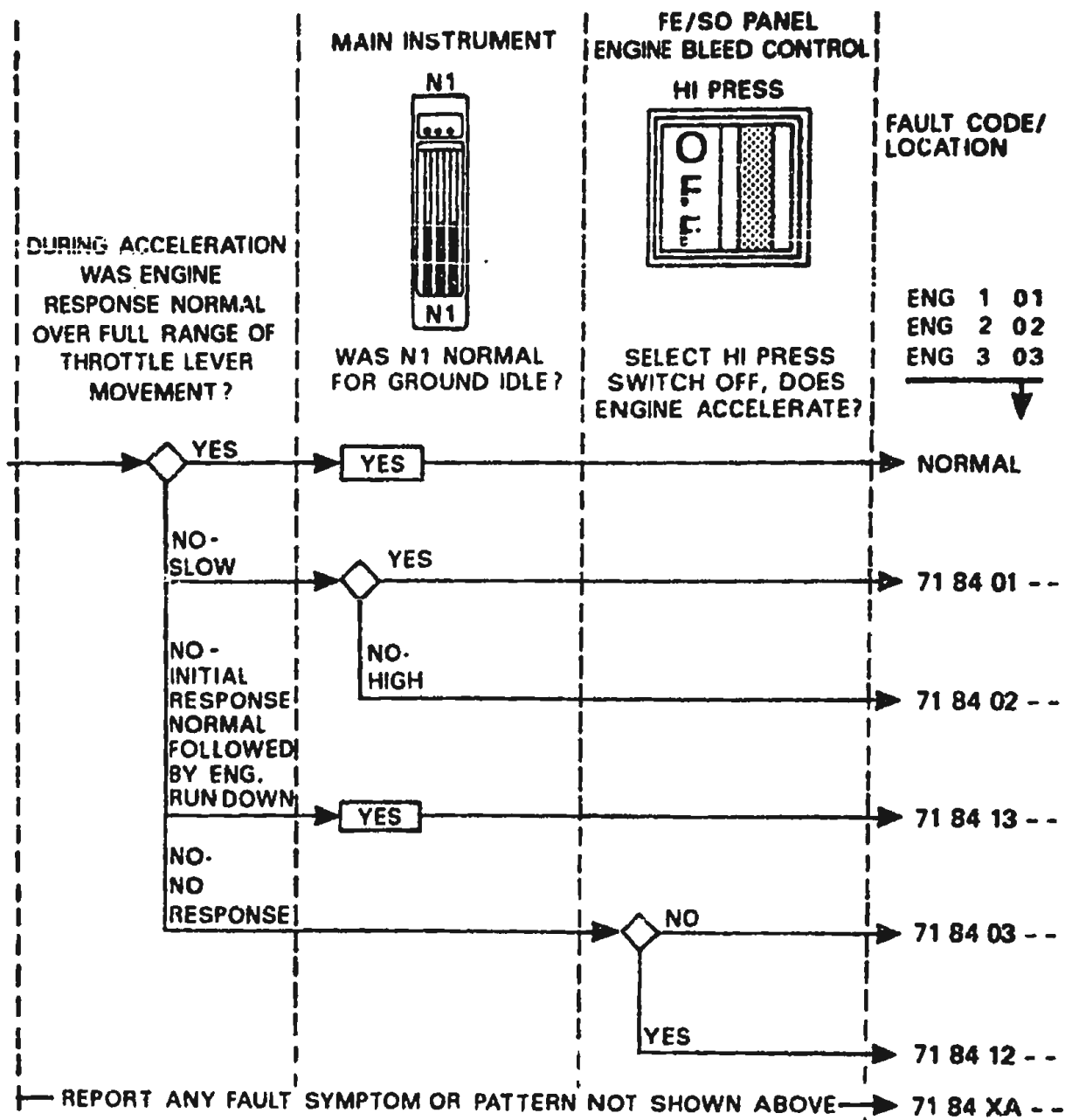
Throttle Lever Stagger - Fault Codes
Figure 5

EFFECTIVITY: ALL

71-FAULT CODE DIAGRAM

Page 5
Mar 15/83

050B



APPLICABLE CIRCUIT BREAKERS
1G13, 14, 15 HI PRESS VALVES

A9852
ED1-0000-71-1086

R

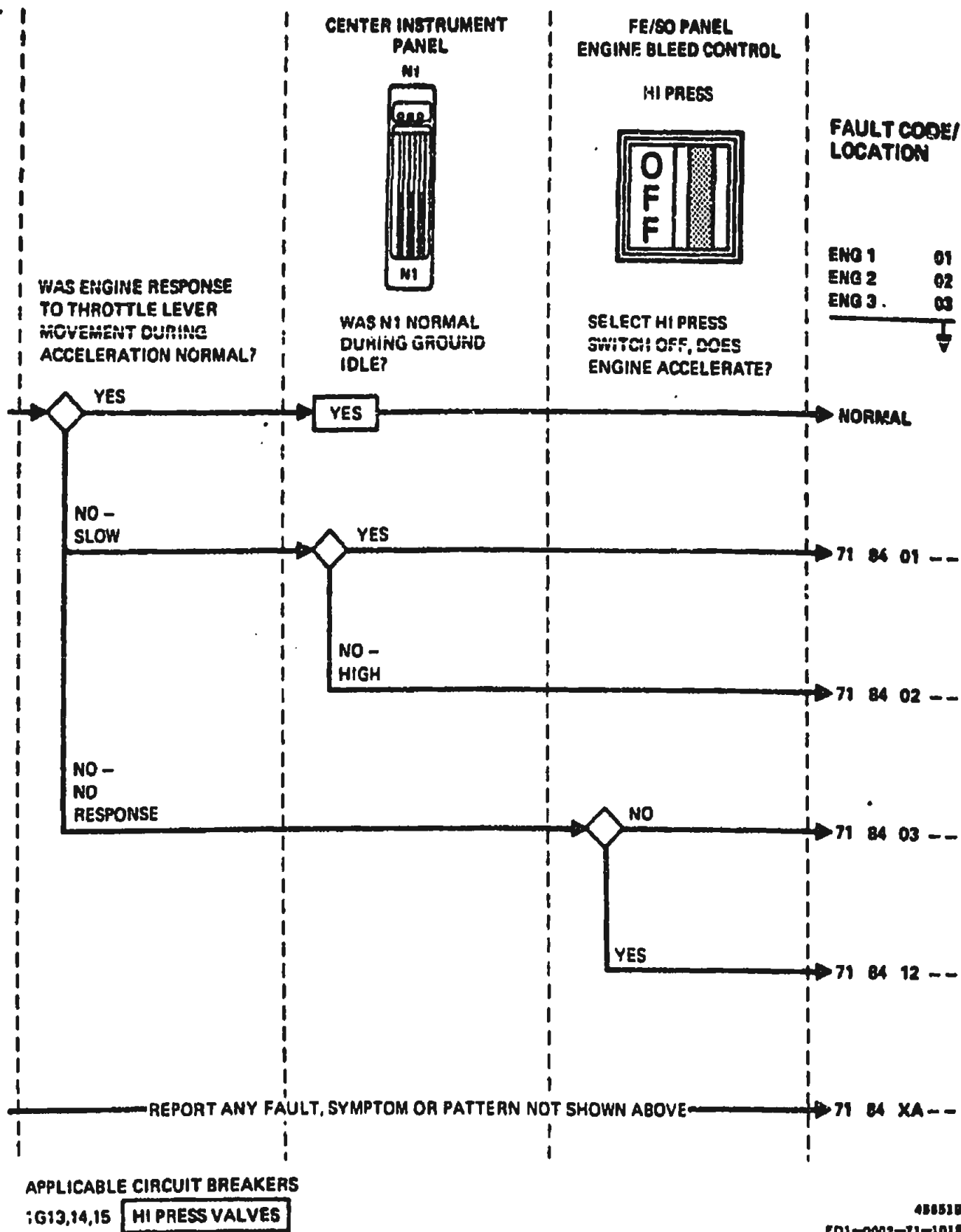
Acceleration/ Deceleration - Fault Codes
Figure 6

R EFFECTIVITY: -22B ENGINES

71-FAULT CODE DIAGRAM

050B

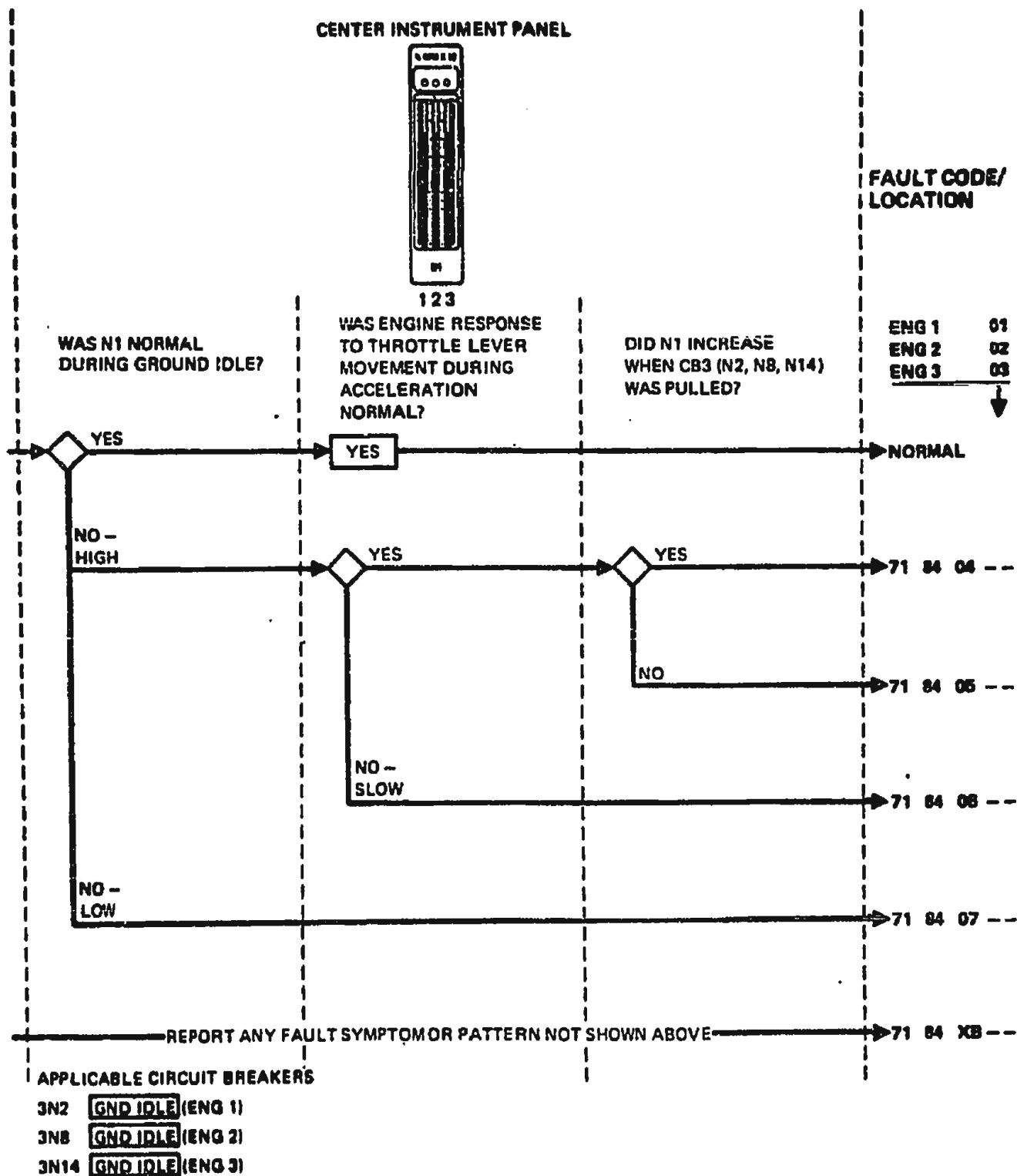
Page 6
Dec 15/91



Acceleration - Fault Codes
Figure 7

R EFFECTIVITY: -524 ENGINES
R
050B

71-FAULT CODE DIAGRAM
Page 7
Dec 15/91



ED1-0001-71-1017

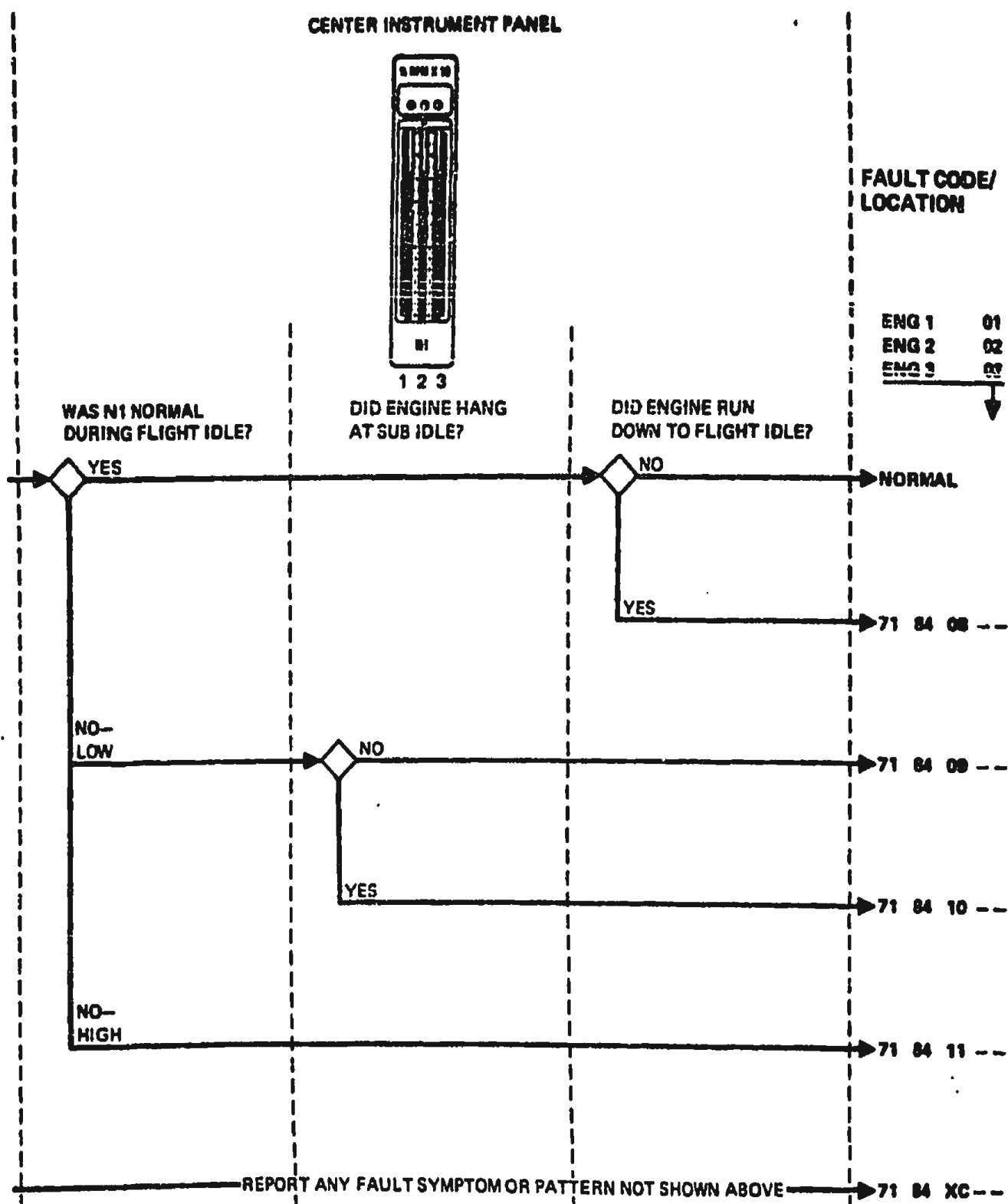
Ground Idle - Fault Codes
Figure 8

R
R
050B

EFFECTIVITY: ALL

71-FAULT CODE DIAGRAM

Page 8
Dec 15/91



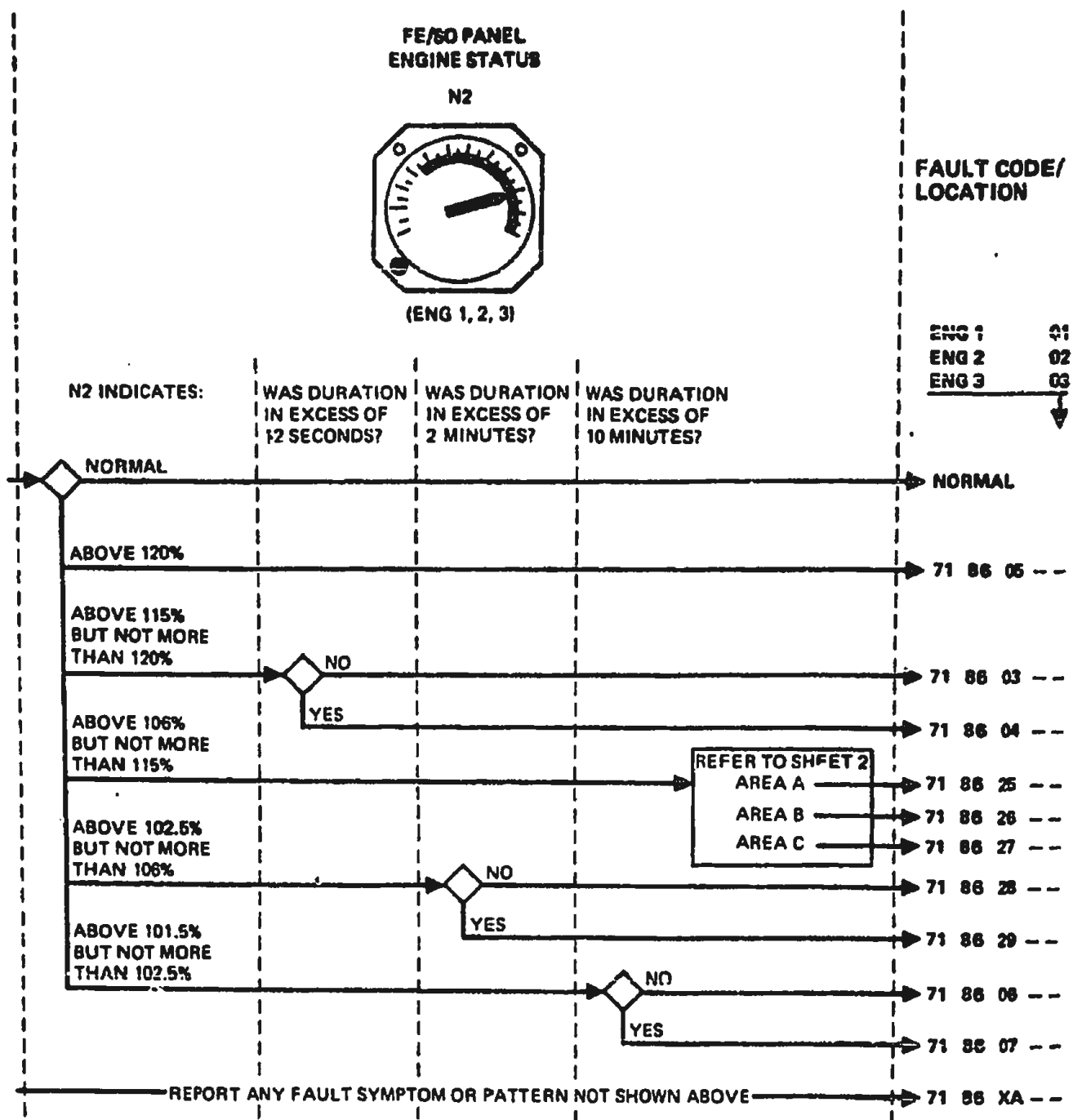
ED1-0001-71-1019

Flight Idle - Fault Codes
Figure 9

71-FAULT CODE DIAGRAM

Page 9
Dec 15/91

R EFFECTIVITY: ALL
R
050B

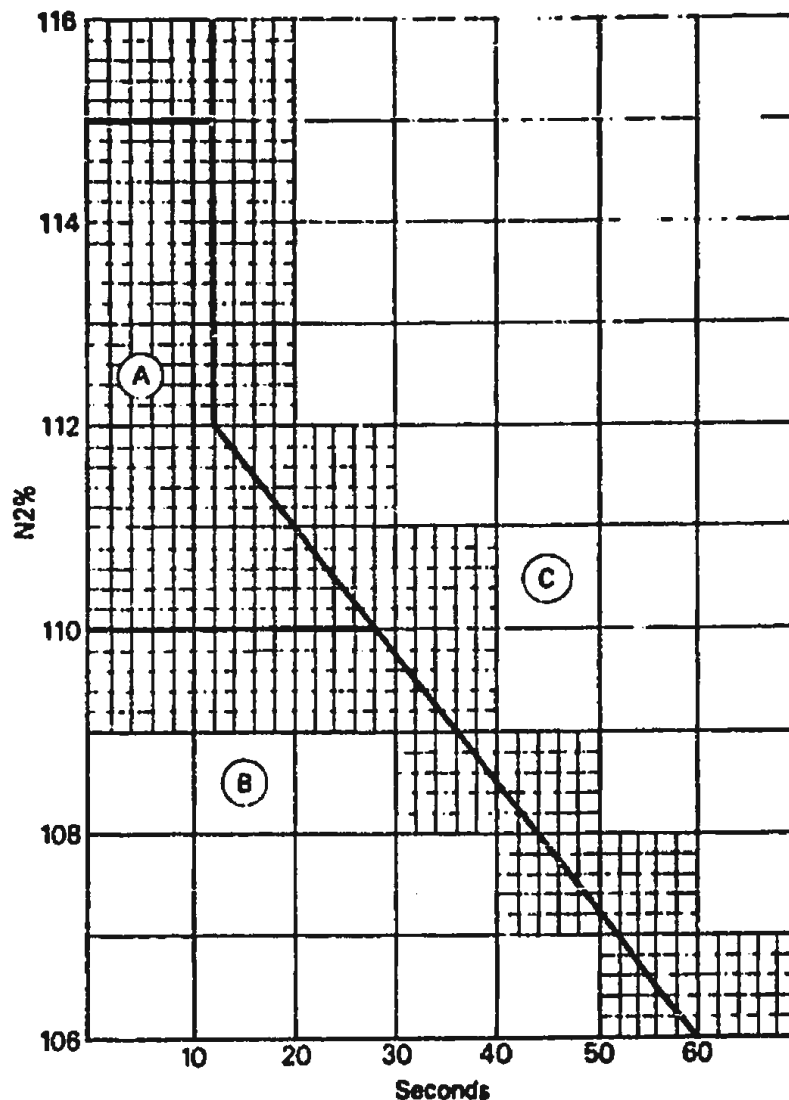

 58707
 ED1-0004-71-1020

 N2 Operating Limit Exceeded (Sheet 1) - Fault Codes
 Figure 10

 R
 R
 050B

EFFECTIVITY: ALL

71-FAULT CODE DIAGRAM
 Page 10
 Dec 15/91



56706
ED1-0000-71-1078

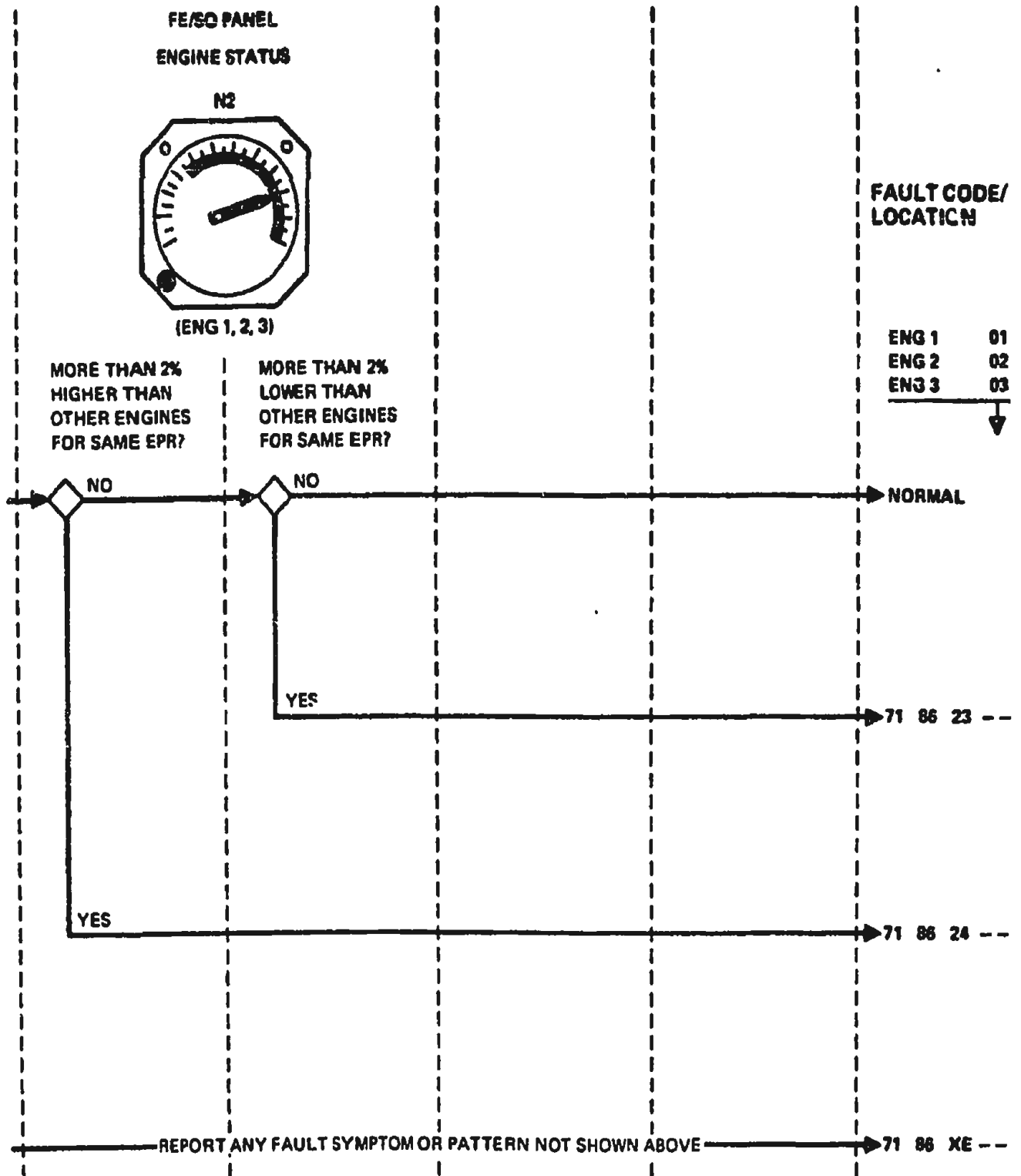
N2 Operating Limit Exceeded (Sheet 2) - Fault Codes
Figure 11

R
R
050B

EFFECTIVITY: ALL

71-FAULT CODE DIAGRAM

Page 11
Dec 15/91



EO1-0000-71-1024

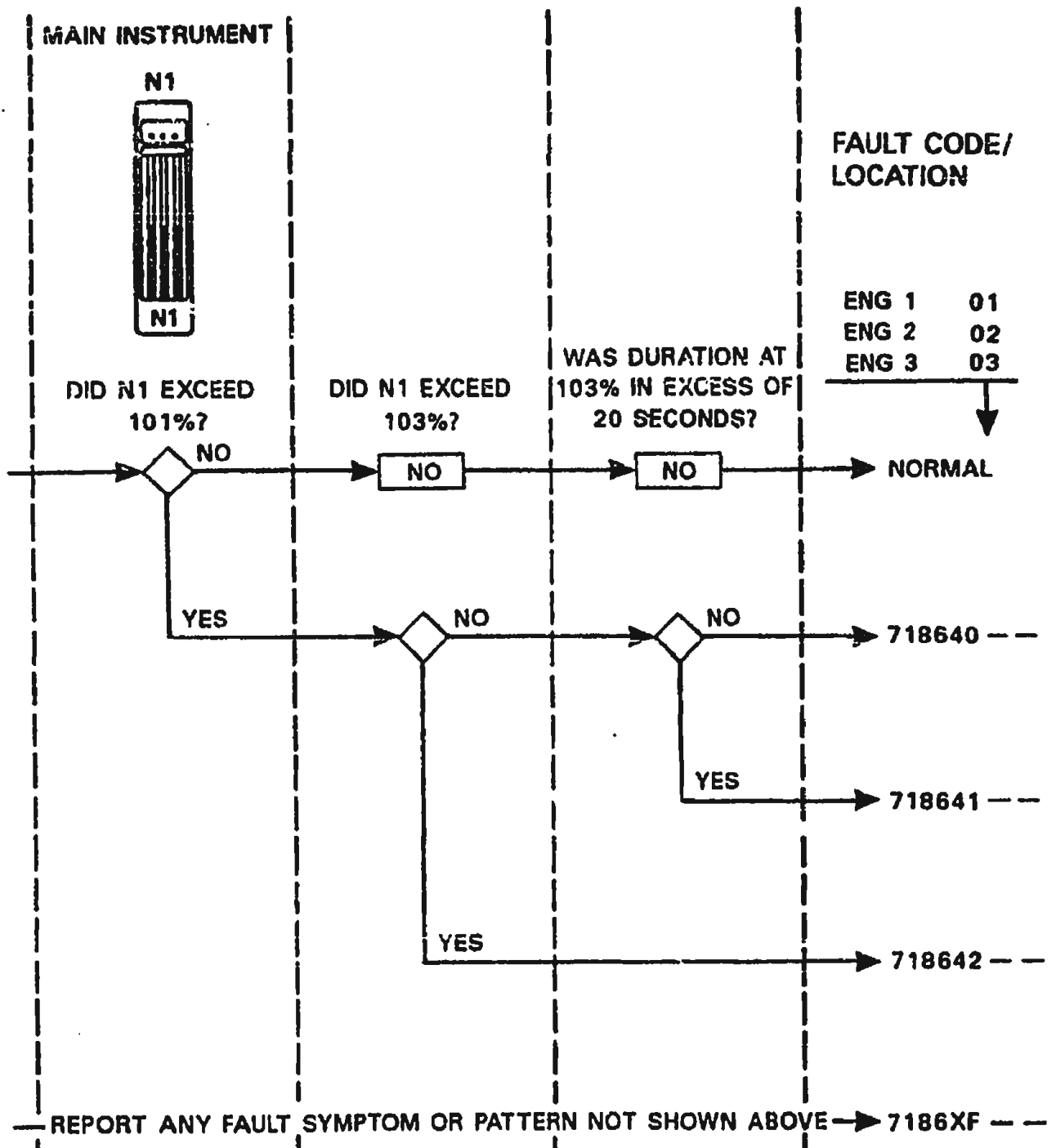
N2 Trend High/Low - Fault Codes
Figure 12

R EFFECTIVITY: ALL

050B

71-FAULT CODE DIAGRAM

Page 12
Dec 15/91



A2045

ED1-0000-71-1091

R

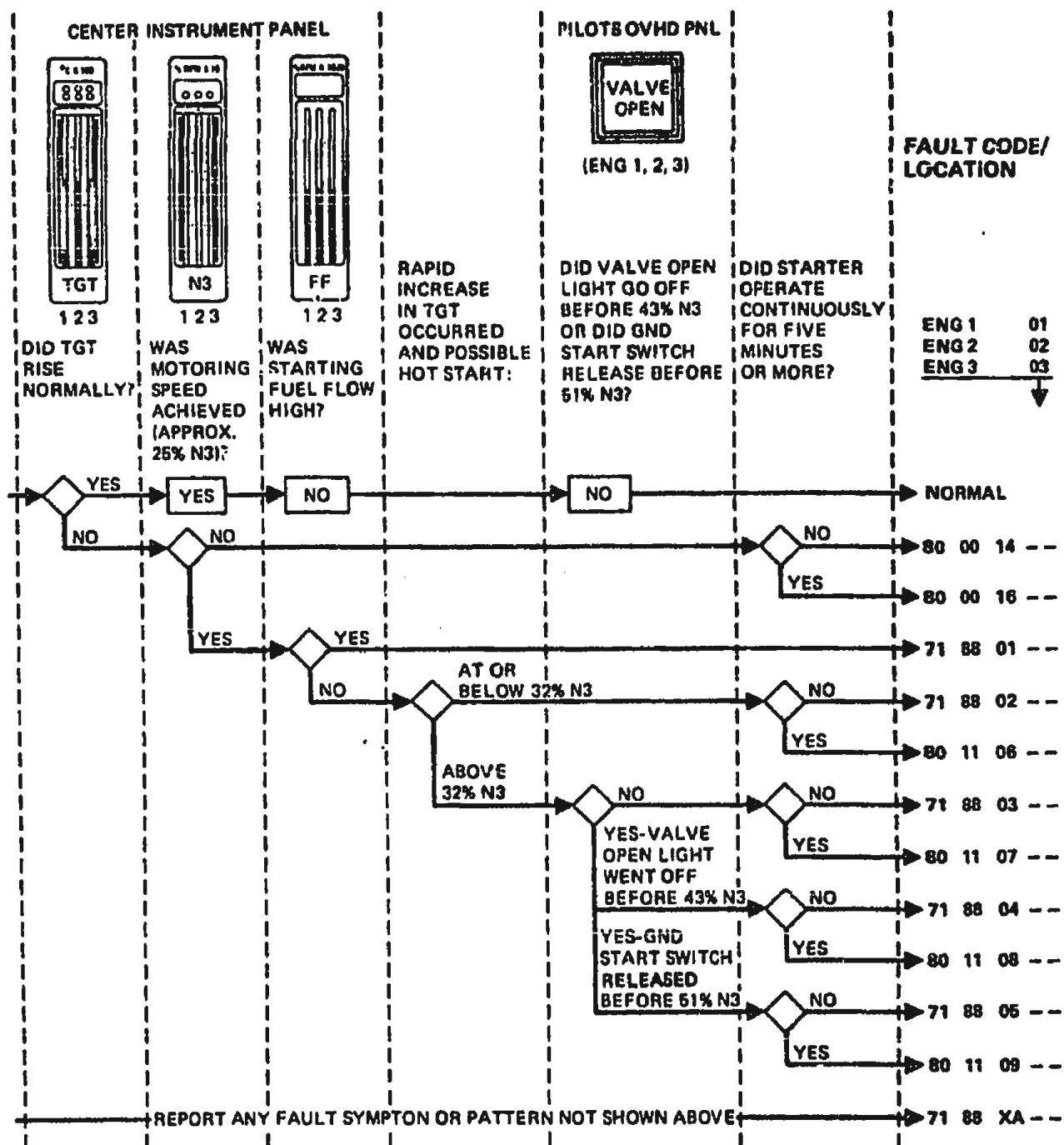
N1 Operating Limit Exceeded - Fault Codes
Figure 13

R EFFECTIVITY: ALL

0508

71-FAULT CODE DIAGRAM

Page 13
Jun 15/95



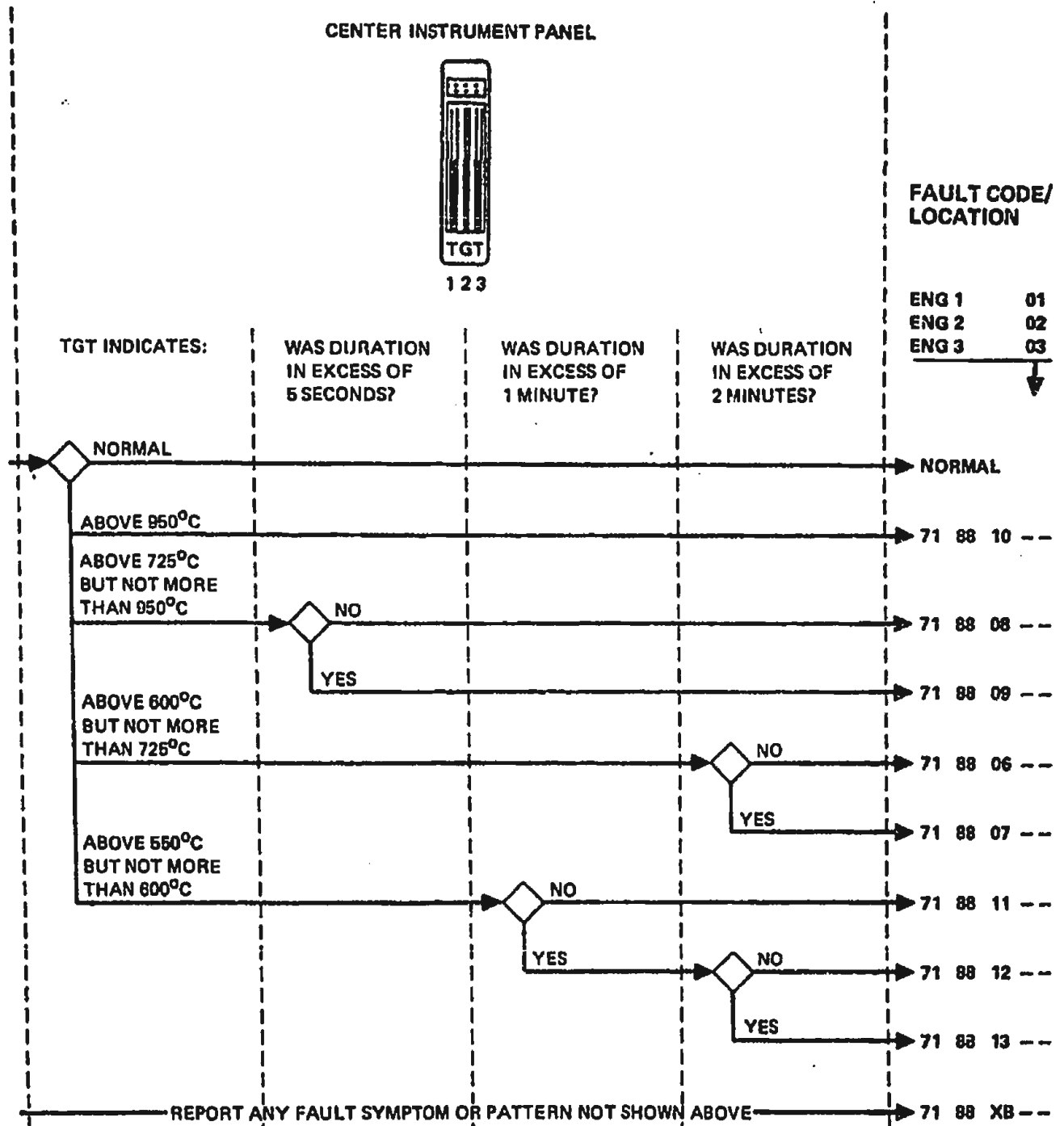
ED1-0000-71-1003

High Temp/Possible Overtemp During Starting - Fault Codes
Figure 14

71-FAULT CODE DIAGRAM

Page 14
Jun 15/95

R EFFECTIVITY: ALL
R
050B



ED1-0002-71-1028

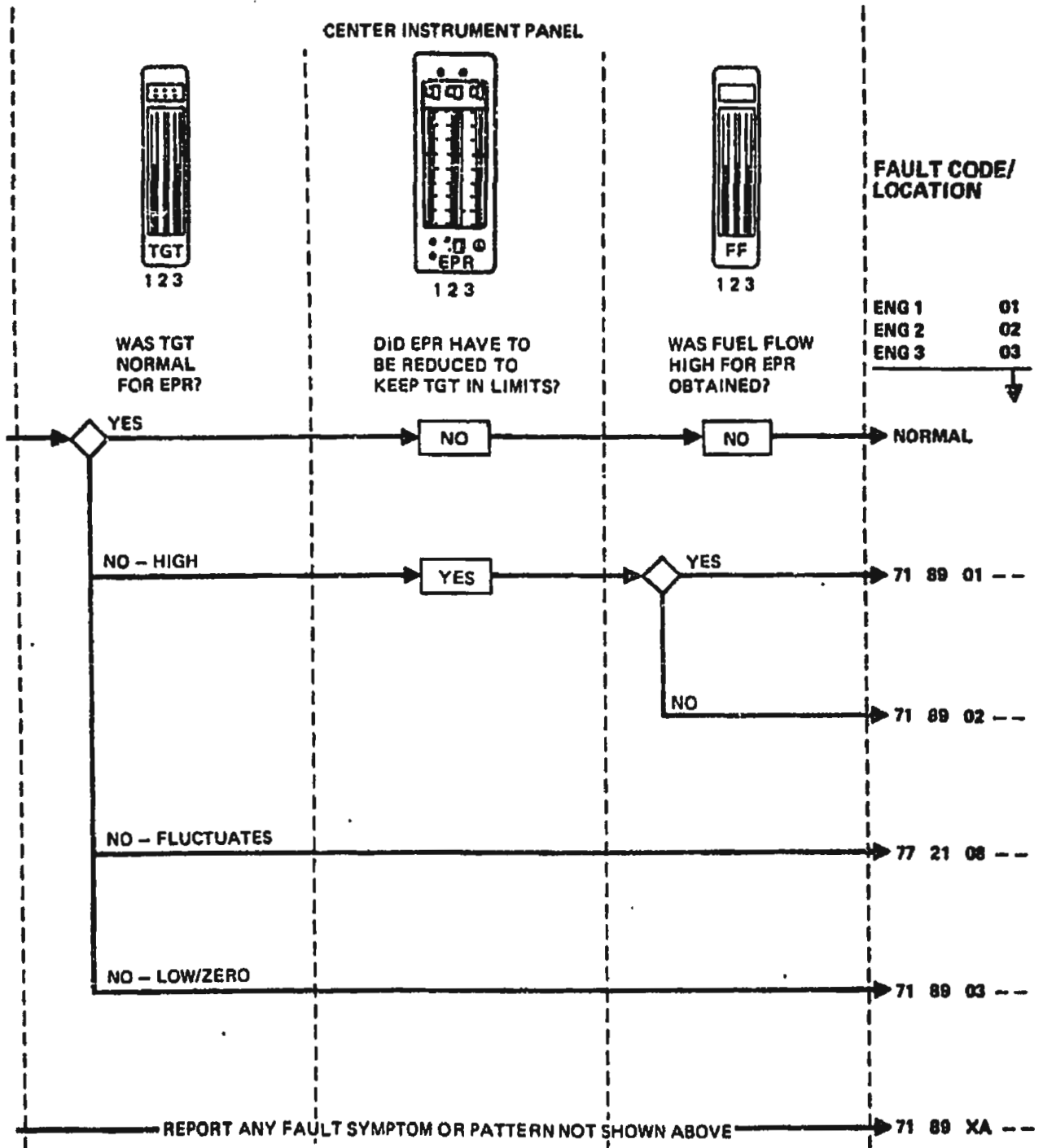
Overtemp (Starting And Relighting) - Fault Codes
Figure 15

71-FAULT CODE DIAGRAM

Page 15
Jun 15/95

R
R
050B

EFFECTIVITY: ALL



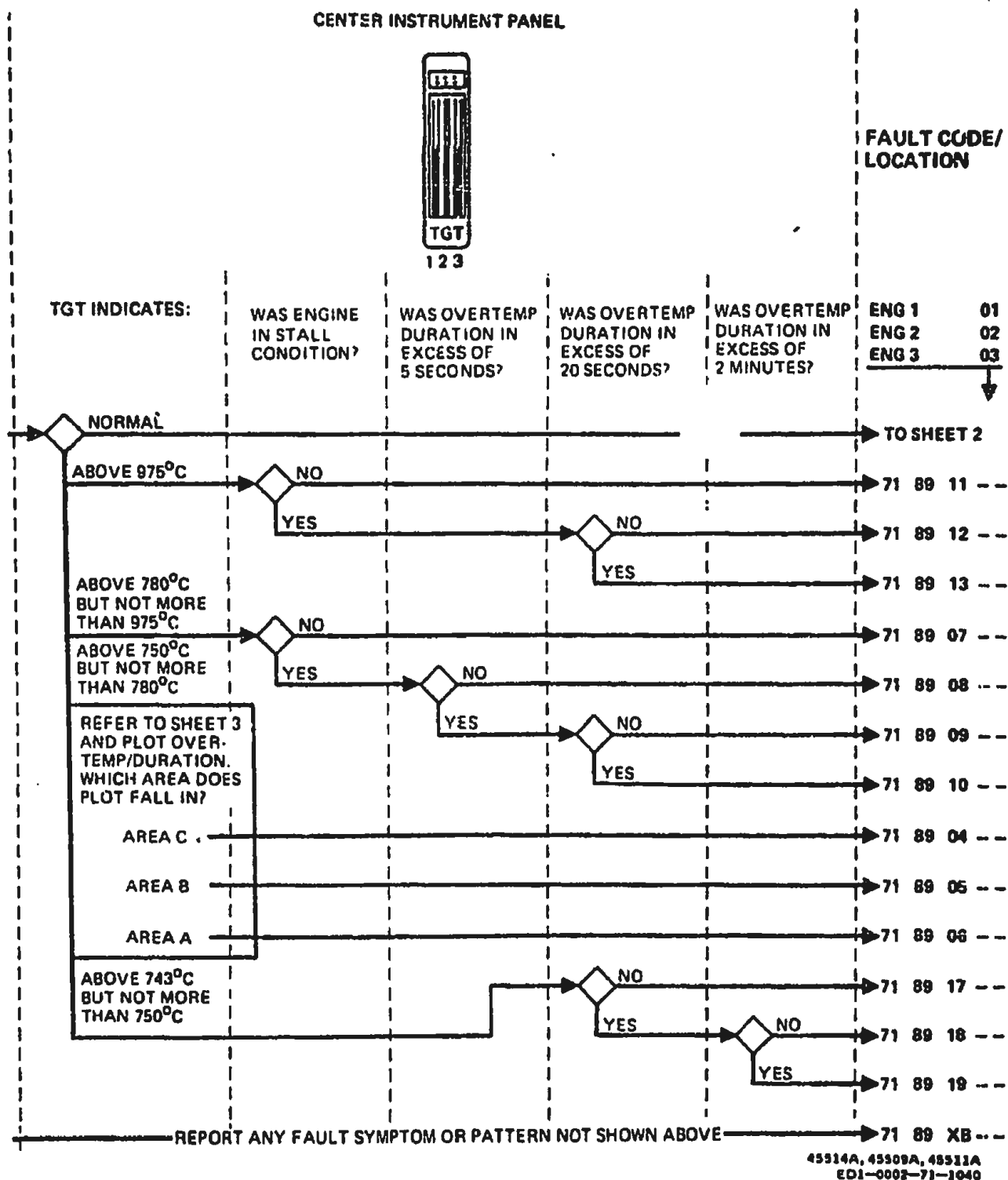
45767
ED1-0000-71-1038

Turbine Gas Temp - Fault Codes
Figure 16

71-FAULT CODE DIAGRAM

Page 16
Jun 15/95

R EFFECTIVITY: ALL
R
050B



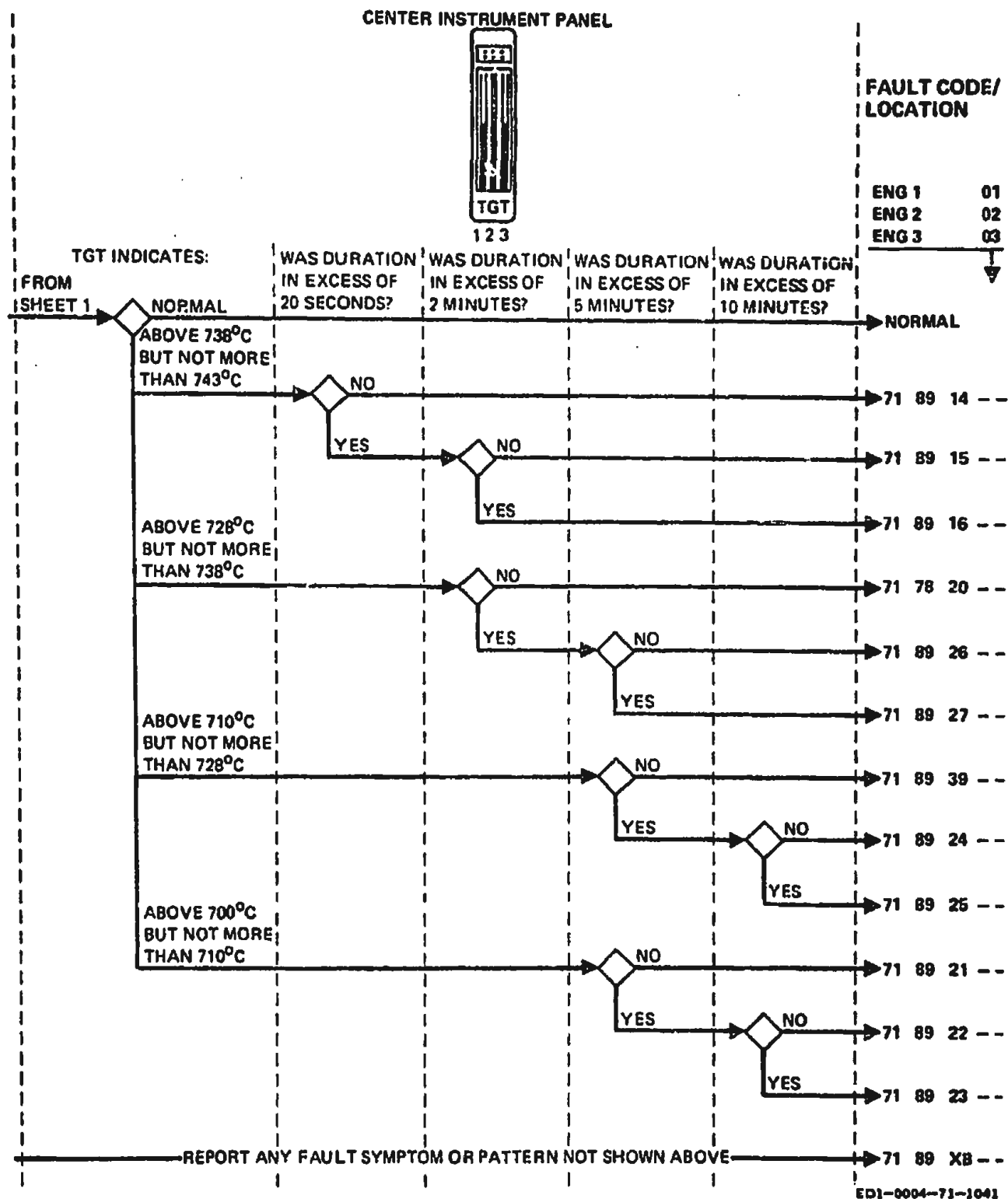
Overtemp (Except Starting) (Sheet 1) - Fault Codes
Figure 17

R R EFFECTIVITY: ALL

050B

71-FAULT CODE DIAGRAM

Page 17
Jun 15/95

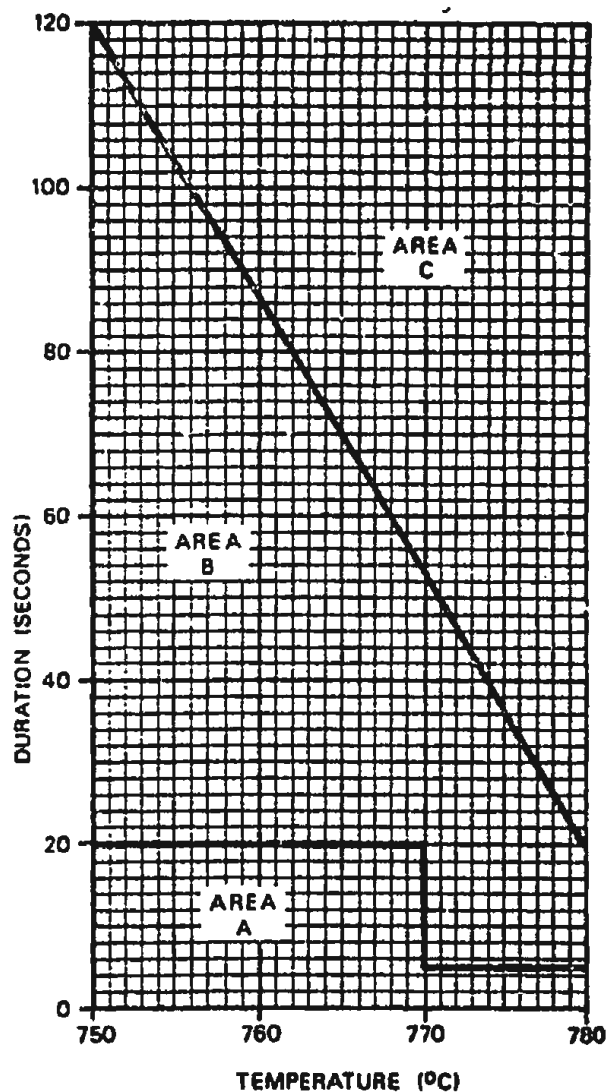


Overtemp (Except Starting) (Sheet 2) - Fault Codes
Figure 18

R EFFECTIVITY: ALL
R
050B

71-FAULT CODE DIAGRAM

Page 18
Jun 15/95



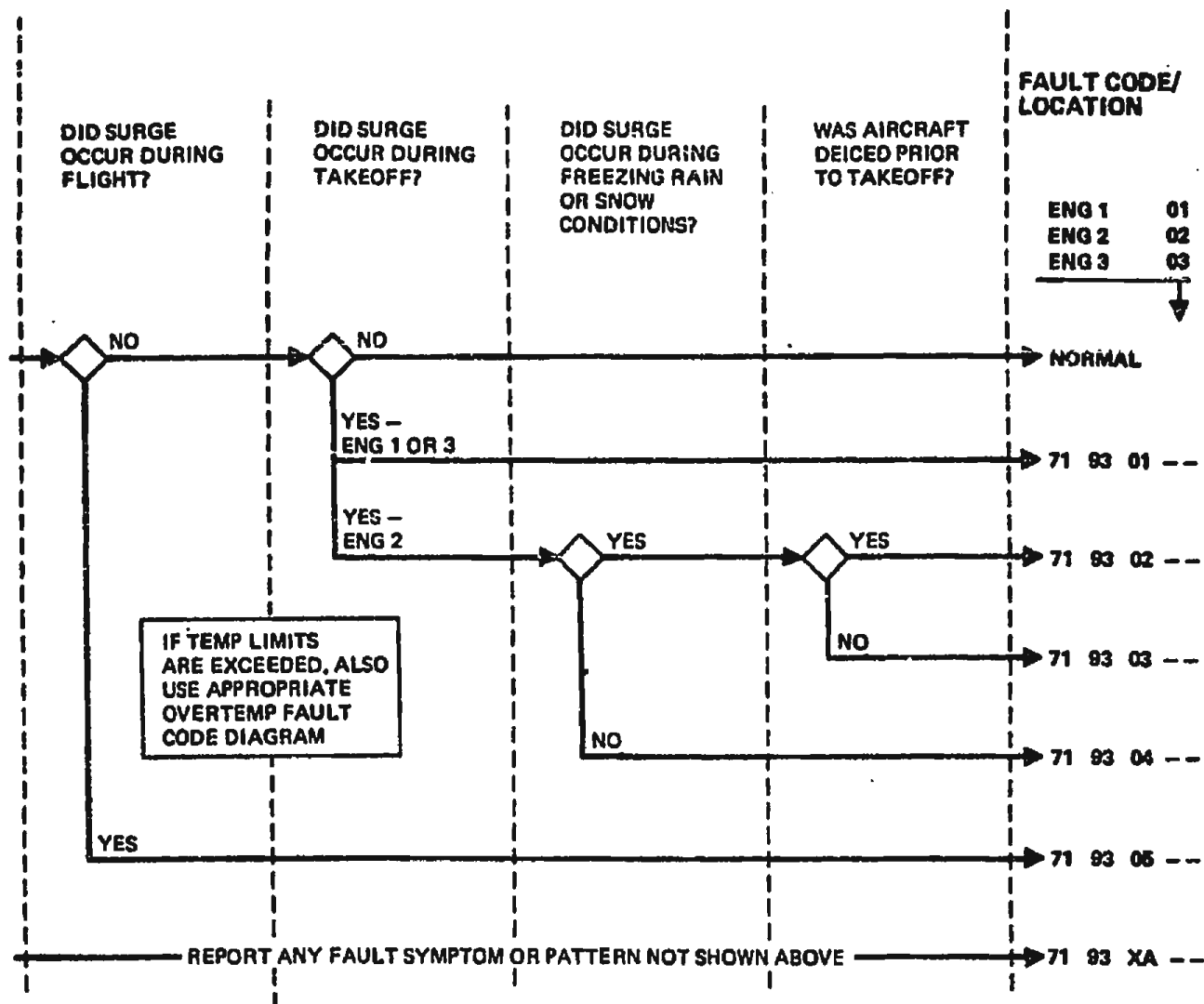
36420
ED1-0001-71-1039

Overtemp (Except Starting) (Sheet 3) - Fault Codes
Figure 19

R EFFECTIVITY: ALL
R
050B

71-FAULT CODE DIAGRAM

Page 19
Jun 15/95



45645
EO1-0001-71-1046

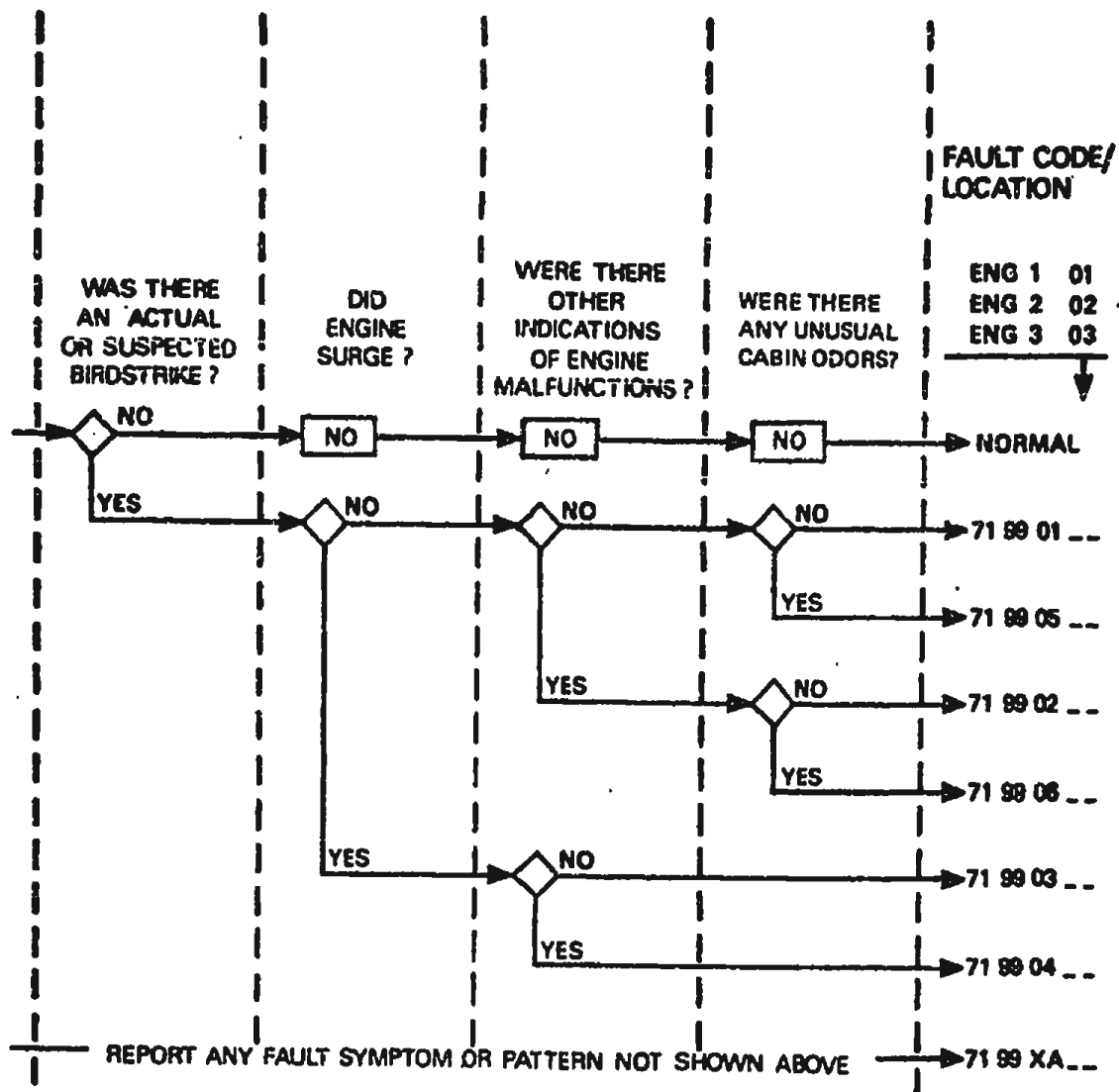
Engine Surge (Stall) - Fault Codes
Figure 20

R
R
050B

EFFECTIVITY: ALL

71-FAULT CODE DIAGRAM

Page 20
Jun 15/95



48847A
ED1-0001-71-1060

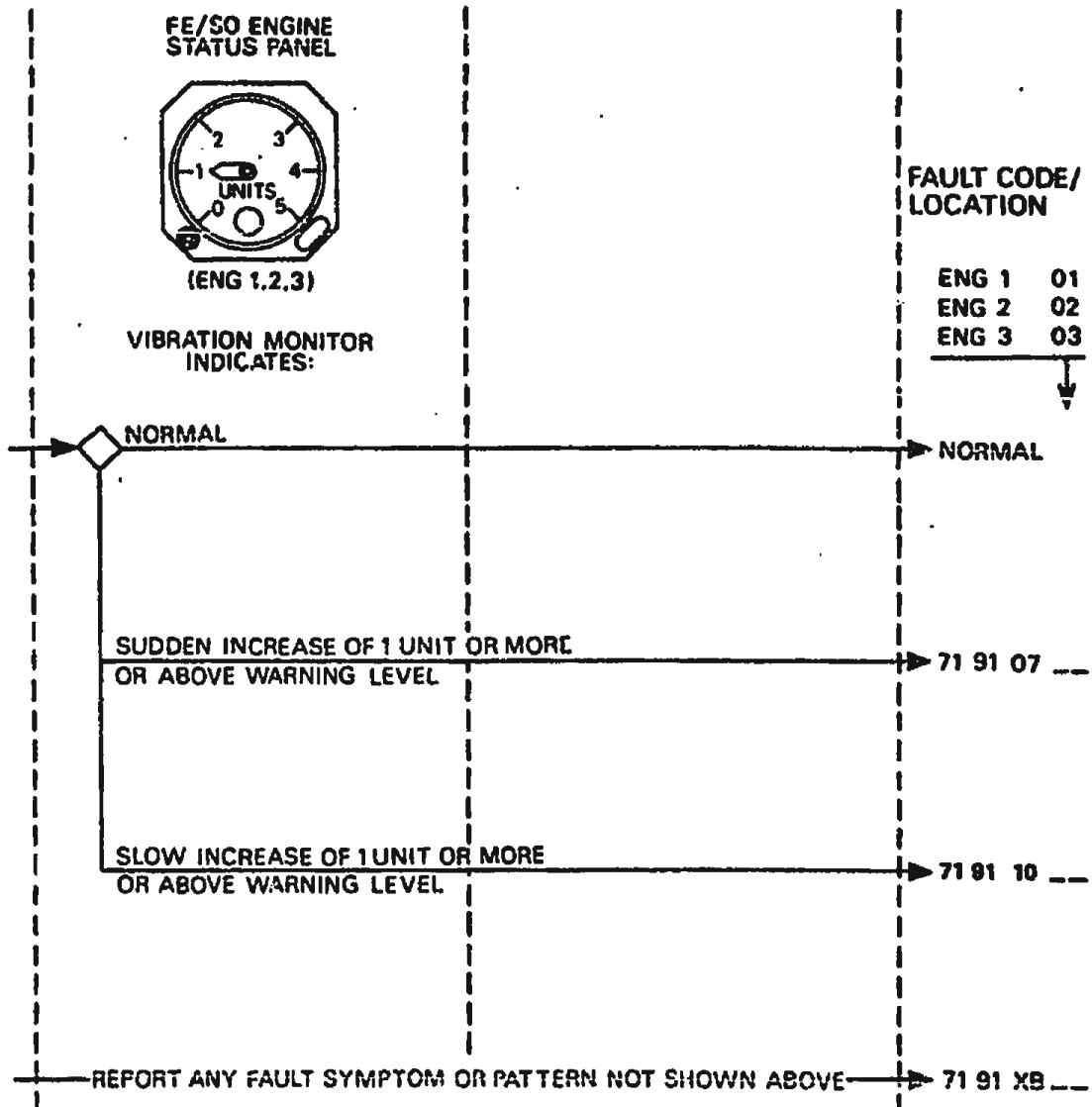
Bird Strike - Fault Codes
Figure 21

71-FAULT CODE DIAGRAM

Page 21
Jun 15/95

R EFFECTIVITY: ALL

0508



30394A
ED1-0001-71-1069

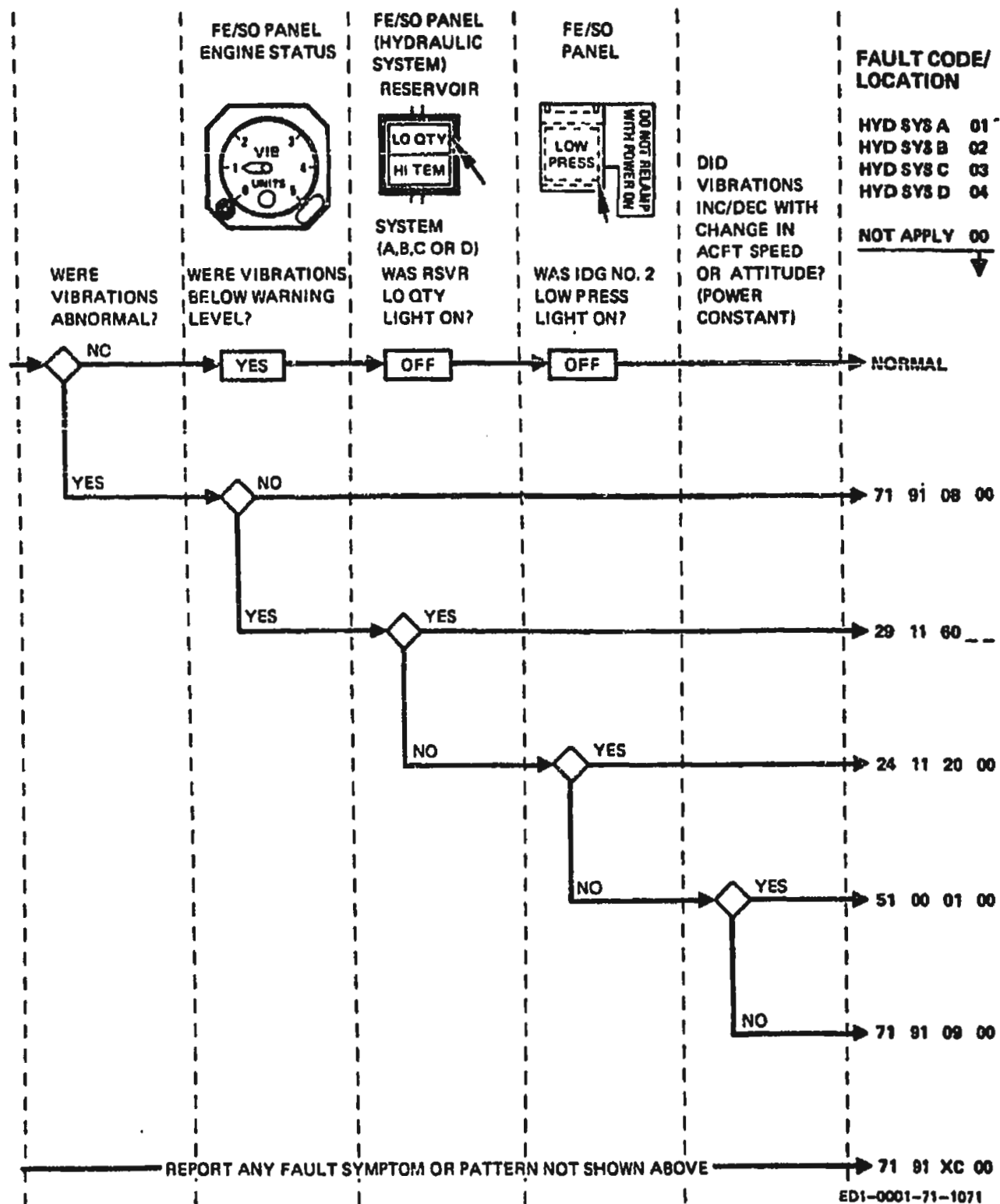
Vibration - Fault Codes
Figure 22

R
R
050B

EFFECTIVITY: ALL

71-FAULT CODE DIAGRAM

Page 22
Jun 15/95



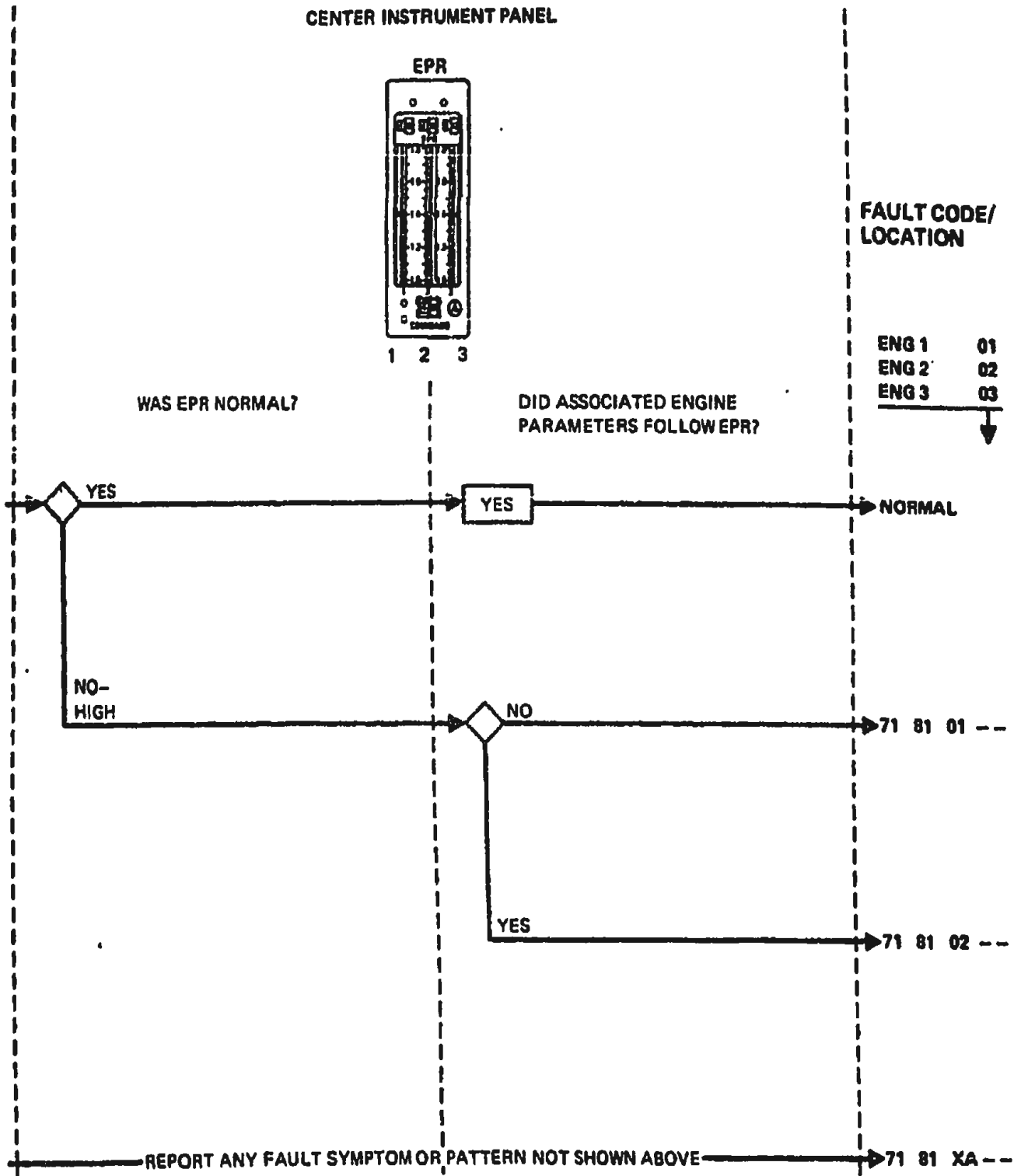
Aft Cabin Vibration - fault Codes
Figure 23

R
R
0508

EFFECTIVITY: ALL

71-FAULT CODE DIAGRAM

Page 23
Jun 15/95



ED1-0000-71-1000

High Power - Fault Codes
Figure 24

R EFFECTIVITY: ALL
R
050B

71-FAULT CODE DIAGRAM
Page 24
Jun 15/95

FAULT CODE INDEX
TABLE 1

FAULT CODE	1. LOG BOOK REPORT	
	2. FAULT ISOLATION REFERENCE	
71 80 XA —	1.	A Low Power fault was encountered by the crew which is not covered in the fault code diagram. (Ref. Fault Code diagram for flight crew actions.)
R	2.	71-80-00 Fig. 103, 104, 105, 106 Block 1
71 80 XB —	1.	A Decrease In Power fault was encountered by the crew which is not covered in the fault code diagram. (Ref. Fault Code diagram for flight crew actions.)
	2.	71-80-00 Fig. 107 Block 1
71 80 XD —	1.	An Engine Flameout fault was encountered by the crew which is not covered in the fault code diagram. (Ref. Fault Code diagram for flight crew actions.)
	2.	71-80-00 Fig. 108 Block 1
71 81 XA —	1.	An High Power fault was encountered by the crew which is not covered in the fault code diagram. (Ref. Fault Code diagram for flight crew actions.)
R	2.	71-80-00 Fig. 103, 104 Block 1
71 82 XA —	1.	A Fluctuating Power fault was encountered by the crew which is not covered in the fault code diagram. (Ref. Fault Code diagram for flight crew actions.)
R	2.	71-82-00 Fig. 103, 104 Block 1

EFFECTIVITY: ALL

050B

71-FAULT CODE INDEX

Page 1
Aug 15/82

FAULT CODE INDEX
TABLE 1 (CONTINUED)

FAULT CODE	-----	
	1. LOG BOOK REPORT	2. FAULT ISOLATION REFERENCE

71 83 XA ____	1. A Throttle Lever Stagger fault was encountered by the crew which is not covered in the fault code diagram. (Ref. Fault Code diagram for flight crew actions.)	
	2. 71-83-00 Fig. 103, 104, 105, 106 Block 1	
71 84 XA ____	1. An Acceleration fault was encountered by the crew which is not covered in the fault code diagram. (Ref. Fault Code diagram for flight crew actions.)	
	2. 71-84-00 Fig. 103, 104, 105 Block 1	
71 84 XB ____	1. A Ground Idle fault was encountered by the crew which is not covered in the fault code diagram. (Ref. Fault Code diagram for flight crew actions.)	
	2. 71-84-00 Fig. 104, 106 Block 1	
71 84 XC ____	1. A Flight Idle fault was encountered by the crew which is not covered in the fault code diagram. (Ref. Fault Code diagram for flight crew actions.)	
	2. 71-84-00 Fig. 105, 106 Block 1	
R 71 86 XA ____	1. A N2 Operating Limit Exceeded fault was encountered by the crew which is not covered in the fault code diagram. (Ref. Fault Code diagram for flight crew actions.)	
R		
R		
R		
R	2. 71-86-00 Fig. 104, 105, 106, 107 Block 1	

EFFECTIVITY: ALL

71-FAULT CODE INDEX

FAULT CODE INDEX
TABLE 1 (CONTINUED)

FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE
71 86 XE —	1. A N2 Trend High/Low fault was encountered by the crew which is not covered in the fault code diagram. (Ref. Fault Code diagram for flight crew actions.) 2. 71-86-00 Fig. 103 Block 1
R 71 86 XF — R R R	1. A N1 Operating Limit Exceeded fault was encountered by the crew which is not covered in the fault code diagram. (Ref. Fault Code diagram for flight crew actions.) 2. 71-86-00 Fig. 108 Block 1
R	
71 88 XA —	1. An High Temp/Possible Overtemp During Starting fault was encountered by the crew which is not covered in the fault code diagram. (Ref. Fault Code diagram for flight crew actions.) 2. 71-88-00 Fig. 103, 104 Block 1 80-00-00 Fig. 106 Block 1
71 88 XB —	1. An Overtemp (Starting And Relighting) fault was encountered by the crew which is not covered in the fault code diagram. (Ref. Fault Code diagram for flight crew actions.) 2. 71-88-00 Fig. 105, 106, 107 Block 1
71 89 XA —	1. A Turbine Gas Temp fault was encountered by the crew which is not covered in the fault code diagram. (Ref. Fault Code diagram for flight crew actions.) 2. 71-89-00 Fig. 107, 108 Block 1 77-21-00 Fig. 103 Block 1

EFFECTIVITY: ALL

0508

71-FAULT CODE INDEX

 Page 3
 Jun 15/95

FAULT CODE INDEX
TABLE 1 (CONTINUED)

FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE
71 89 XB —	1. An Overtemp (Except Starting) fault was encountered by the crew which is not covered in the fault code diagram. (Ref. Fault Code diagram for flight crew actions.) 2. 71-89-00 Fig. 103, 104, 105, 106 Block 1
71 91 XB —	1. A Vibration fault was encountered by the crew which is not covered in the fault code diagram. (Ref. Fault Code diagram for flight crew actions.) 2. 71-91-00 Fig. 103 Block 1 77-31-00 Fig. 103 Block 1
71 91 XC 00	1. An Aft Cabin Vibration fault was encountered by the crew which is not covered in the fault code diagram. (Ref. Fault Code diagram for flight crew actions.) 2. 71-91-00 Fig. 104 Block 1
71 93 XA —	1. An Engine Surge (Stall) fault was encountered by the crew which is not covered in the fault code diagram. (Ref. Fault Code diagram for flight crew actions.) 2. 71-93-00 Fig. 101, 102 Block 1
71 95 XA —	1. An Engine Turbine Cooling Air Overheat fault was encountered by the crew which is not covered in the fault code diagram. (Ref. Chapter 77 for Fault Code diagram.) 2. 71-95-00 Fig. 101 Block 1 77-22-00 Fig. 103 (Sheet 1) Block 1

R
R

050B

EFFECTIVITY: ALL

71-FAULT CODE INDEX

Page 4
Jun 15/95

FAULT CODE INDEX
TABLE 1 (CONTINUED)

FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE
71 99 XA —	1. A Bird Strike fault was encountered by the crew which is not covered in the fault code diagram. (Ref. Fault Code diagram for flight crew actions.) 2. 71-99-00 Fig. 101, 102, 103, 104 Block 1
71 00 00 00	1. NOT USED.
71 00 01 00	1. NOT USED.
71 00 02 00	1. NOT USED.
71 00 03 00	1. NOT USED.
71 00 04 00	1. ENG 2 FAIL and ENGINE 2 FAIL-ARMED lights on. Flaps and throttles within takeoff range and N2 dropped below 80% RPM. All engine parameters decreased considerably below scheduled power. 2. 71-00-22 Fig. 110 Block 1
71 80 01 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) low EPR. All other associated parameters normal. 2. 71-80-00 Fig. 105 Block 5
71 80 02 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) low EPR. High N2. All other associated parameters low. 2. 71-80-00 Fig. 104 Block 1
71 80 03 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) low EPR. High TGT. All other associated parameters low. 2. 71-80-00 Fig. 106 Block 1

R EFFECTIVITY: ALL

R
050B

71-FAULT CODE INDEX

Page 5
Jun 15/95

FAULT CODE INDEX
TABLE 1 (CONTINUED)

FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE
71 80 04 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) low EPR. Not throttle limited. All other associated parameters low. 2. 71-80-00 Fig. 105 Block 5
71 80 05 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) low EPR. Throttle limited. Setting fuel control amp switch to OVRD restored EPR. 2. 71-80-00 Fig. 103 Block 2
71 80 06 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) low EPR. Throttle limited. Setting fuel control amp switch to OVRD did not restore EPR. 2. 71-80-00 Fig. 103 Block 8
71 80 07 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) EPR indication zero. All other associated parameters normal. 2. 71-80-00 Fig. 105 Block 2
71 80 08 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) sudden decrease in EPR with associated parameters following EPR. Setting fuel control amp switch to OVRD restored EPR. 2. 71-80-00 Fig. 107 Block 2
71 80 09 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) sudden decrease in EPR with associated parameters following EPR. Setting fuel control amp switch to OVRD did not restore EPR. 2. 71-80-00 Fig. 107 Block 3

FAULT CODE INDEX
TABLE 1 (CONTINUED)-----
FAULT
CODE

1. LOG BOOK REPORT
-
2. FAULT ISOLATION REFERENCE
-
-

- 71 80 10 1. (01=ENG 1, 02=ENG 2, 03=ENG 3) gradual decrease in EPR with associated parameters following EPR. Setting fuel control amp switch to OVRD restored EPR.
2. 71-80-00 Fig. 107 Block 2
- 71 80 11 1. (01=ENG 1, 02=ENG 2, 03=ENG 3) gradual decrease in EPR with associated parameters following EPR. Setting fuel control amp switch to OVRD did not restore EPR.
2. 71-80-00 Fig. 107 Block 3
- 71 80 12 00 1. NOT USED.
- 71 80 13 00 1. NOT USED.
- 71 80 14 00 1. NOT USED.
- 71 80 15 00 1. NOT USED.
- 71 80 16 00 1. NOT USED.
- 71 80 17 00 1. NOT USED.
- 71 80 18 1. (01=ENG 1, 02=ENG 2, 03=ENG 3) flameout. N3 indication after flameout. OIL FILTER PRESSURE light not on prior to flameout. Other engine parameters abnormal.
2. 71-80-00 Fig. 108 Block 2
- 71 80 19 1. (01=ENG 1, 02=ENG 2, 03=ENG 3) flameout. N3 indication after flameout. OIL FILTER PRESSURE light on prior to flameout. Other engine parameters abnormal.
2. 71-80-00 Fig. 108 Block 2

R EFFECTIVITY: ALL
R
050B

71-FAULT CODE INDEX

Page 7
Jun 15/95

FAULT CODE INDEX
TABLE 1 (CONTINUED)

FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE	
71 80 20 —	1.	(O1=ENG 1, O2=ENG 2, O3=ENG 3) flameout. No M3 indication after flameout. Other engine parameters abnormal.
	2.	71-80-00 Fig. 108 Block 1
71 81 01 —	1.	(O1=ENG 1, O2=ENG 2, O3=ENG 3) high EPR with all associated parameters normal.
	2.	71-81-00 Fig. 103 Block 1
71 81 02 —	1.	(O1=ENG 1, O2=ENG 2, O3=ENG 3) high EPR with all associated parameters following EPR.
	2.	71-81-00 Fig. 104 Block 1
71 82 01 —	1.	(O1=ENG 1, O2=ENG 2, O3=ENG 3) fluctuating EPR with other associated parameters following EPR. Setting fuel control amp switch to OVRD stopped EPR fluctuations.
	2.	71-82-00 Fig. 103 Block 2
71 82 02 —	1.	(O1=ENG 1, O2=ENG 2, O3=ENG 3) fluctuating EPR with other associated parameters following EPR. Setting fuel control amp switch to OVRD did not stop EPR fluctuations.
	2.	71-82-00 Fig. 103 Block 3
71 82 03 —	1.	(O1=ENG 1, O2=ENG 2, O3=ENG 3) fluctuating EPR. All other associated parameters normal.
	2.	71-82-00 Fig. 104 Block 1
71 83 01 —	1.	(O1=ENG 1, O2=ENG 2, O3=ENG 3) high EPR with throttle levers aligned. All other associated parameters normal. Levers aligned at same N1 setting.
	2.	71-83-00 Fig. 103 Block 1

R EFFECTIVITY: ALL

050B

71-FAULT CODE INDEX

Page 8
Jun 15/95

FAULT CODE INDEX
TABLE 1 (CONTINUED)

FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE
71 83 02 —	1. (O1=ENG 1, O2=ENG 2, O3=ENG 3) low EPR with throttle levers aligned. All other associated parameters normal. Levers aligned at same N1 setting. 2. 71-83-00 Fig. 104 Block 1
71 83 03 —	1. (O1=ENG 1, O2=ENG 2, O3=ENG 3) throttle lever leads other throttle levers at same EPR setting. Lead increased with increase in altitude. Levers not aligned for same N1 setting. 2. 71-83-00 Fig. 105 Block 1
71 83 04 —	1. (O1=ENG 1, O2=ENG 2, O3=ENG 3) throttle lever leads other throttle levers at same EPR setting. Lead remained same with increase in altitude. Levers not aligned for same N1 setting. 2. 71-83-00 Fig. 105 Block 2
71 83 05 —	1. (O1=ENG 1, O2=ENG 2, O3=ENG 3) throttle lever lags behind other throttle levers at same EPR setting. Lag decreased with increase in altitude. Levers not aligned for same N1 setting. 2. 71-83-00 Fig. 106 Block 3
71 83 06 —	1. (O1=ENG 1, O2=ENG 2, O3=ENG 3) throttle lever lags behind other throttle levers at same EPR setting. Lag remained same with increase in altitude. Levers not aligned for same N1 setting. 2. 71-83-00 Fig. 106 Block 1
71 84 01 —	1. (O1=ENG 1, O2=ENG 2, O3=ENG 3) slow to accelerate. N1 normal during ground idle. 2. 71-84-00 Fig. 103 Block 1

R EFFECTIVITY: ALL

R
050B

71-FAULT CODE INDEX

Page 9
Jun 15/95

FAULT CODE INDEX
TABLE 1 (CONTINUED)

FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE
71 84 02 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) slow to accelerate. N1 high during ground idle. 2. 71-84-00 Fig. 104 Block 1
71 84 03 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) no response to throttle lever movement, selecting HI PRESS switch OFF had no effect. 2. 71-84-00 Fig. 105 Block 1
71 84 04 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) N1 high during ground idle. Eng response to throttle lever movement was normal. N1 increased when CB3 (N2, N8, N14) was pulled. 2. 71-84-00 Fig. 106 Block 4
71 84 05 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) N1 high during ground idle. Eng response to throttle lever movement was normal. N1 did not increase when CB3 (N2, N8, N14) was pulled. 2. 71-84-00 Fig. 106 Block 4
71 84 06 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) N1 high during ground idle. Eng response to throttle lever movement was slow. 2. 71-84-00 Fig. 104 Block 1
71 84 07 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) N1 low during ground idle. 2. 71-84-00 Fig. 106 Block 2
71 84 08 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) ran down to flight idle. Other indications normal. 2. 71-84-00 Fig. 105 Block 1

R EFFECTIVITY: ALL

050B

71-FAULT CODE INDEX

Page 10
Jun 15/95

FAULT CODE INDEX
TABLE 1 (CONTINUED)

FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE
71 84 09 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) N1 low during flight idle. Other indications normal. 2. 71-84-00 Fig. 106 Block 2
71 84 10 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) sub-idle hang-up with possible flameout. 2. 71-84-00 Fig. 105 Block 2
71 84 11 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) N1 high during flight idle. Other indications normal. 2. 71-84-00 Fig. 106 Block 5
71 84 12 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) no response to throttle lever movement, engine accelerates when HI PRESS switch selected OFF. 2. 71-84-00 Fig. 105 Block 7
71 84 13 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) run down to sub-idle following initial normal acceleration from ground idle. 2. 71-84-00 Fig. 108 Block 01
71 86 01 00	1. NOT USED.
71 86 02 00	1. NOT USED.
71 86 03 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) N2 increased above 115% but not more than 120% for less than 12 seconds. Record exact N2% ____ and duration of 0/speed ____ (seconds). 2. 71-86-00 Fig. 107 Block 5

FAULT CODE INDEX
TABLE 1 (CONTINUED)

FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE
71 86 04 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) N2 increased above 115% but not more than 120% for longer than 12 seconds. Record exact N2% _____ and duration of 0/speed _____ (seconds). 2. 71-86-00 Fig. 107 Block 4
71 86 05 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) N2 exceeded 120%. Record exact N2% _____ and duration of 0/speed _____ (seconds). 2. 71-86-00 Fig. 107 Block 2
71 86 06 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) N2 increased above 101.5% but not more than 102.5% for less than 10 minutes. Record exact N2% _____ and duration of 0/speed _____ (minutes) _____ (seconds). 2. 71-86-00 Fig. 104 Block 3
71 86 07 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) N2 increased above 101.5% but not more than 102.5% for longer than 10 minutes. Record exact N2% _____ and duration of 0/speed _____ (minutes) _____ (seconds). 2. 71-86-00 Fig. 104 Block 2
71 86 08 00	1. NOT USED.
71 86 09 00	1. NOT USED.
71 86 10 00	1. NOT USED.
71 86 11 00	1. NOT USED.
71 86 12 00	1. NOT USED.
71 86 13 00	1. NOT USED.
71 86 14 00	1. NOT USED.
71 86 15 00	1. NOT USED.
71 86 16 00	1. NOT USED.

R EFFECTIVITY: ALL

050B

71-FAULT CODE INDEX

Page 12
Jun 15/95

FAULT CODE INDEX
TABLE 1 (CONTINUED)

FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE
71 86 17 00	1. NOT USED.
71 86 18 00	1. NOT USED.
71 86 19 00	1. NOT USED.
71 86 20 00	1. NOT USED.
71 86 21 00	1. NOT USED.
71 86 22 00	1. NOT USED.
71 86 23 _	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) N2 more than 2% lower than other engines at same EPR. 2. 71-86-00 Fig. 103 Block 1
71 86 24 _	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) N2 more than 2% higher than other engines at same EPR. 2. 71-86-00 Fig. 103 Block 1
71 86 25 _	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) N2 increased above 106% but not more than 115% for between 1 and 28 seconds. Record exact N2%_ and duration of 0/speed_ (seconds). 2. 71-86-00 Fig. 106 Block 1
71 86 26 _	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) N2 increased above 106% but not more than 115% for between 1 and 60 seconds. Record exact N2%_ and duration of 0/speed_ (seconds). 2. 71-86-00 Fig. 106 Block 1

FAULT CODE INDEX
TABLE 1 (CONTINUED)-----
FAULT
CODE1. LOG BOOK REPORT
2. FAULT ISOLATION REFERENCE

- 71 86 27 ____ 1. (01=ENG 1, 02=ENG 2, 03=ENG 3) N2 increased above 106% but not more than 115% for between 12 and 70 seconds. Record exact N2%____ and duration of 0/speed____ (seconds).
2. 71-86-00 Fig. 106 Block 2
- 71 86 28 ____ 1. (01=ENG 1, 02=ENG 2, 03=ENG 3) N2 increased above 102.5% but not more than 106% for less than 2 minutes. Record exact N2%____ and duration of 0/speed____ (minutes)____ (seconds).
2. 71-86-00 Fig. 105 Block 1
- 71 86 29 ____ 1. (01=ENG 1, 02=ENG 2, 03=ENG 3) N2 increased above 102.5% but not more than 106% for more than 2 minutes. Record exact N2%____ and duration of 0/speed____ (minutes)____ (seconds).
2. 71-86-00 Fig. 105 Block 2
- 71 86 30 00 1. NOT USED.
- 71 86 31 00 1. NOT USED.
- 71 86 32 00 1. NOT USED.
- 71 86 33 00 1. NOT USED.
- 71 86 34 00 1. NOT USED.
- 71 86 35 00 1. NOT USED.
- 71 86 36 00 1. NOT USED.
- 71 86 37 00 1. NOT USED.
- 71 86 38 00 1. NOT USED.
- 71 86 39 00 1. NOT USED.

R EFFECTIVITY: ALL
R
050B

71-FAULT CODE INDEX

Page 14
Jun 15/95

FAULT CODE INDEX
TABLE 1 (CONTINUED)

FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE
R 71 86 40 — R	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) N1 increased above 101% but not more than 103%.
R	2. 71-86-00 Fig. 108 Block 1
R 71 86 41 — R R	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) N1 increased above 101% up to and including 103% for more than 20 seconds.
R	2. 71-86-00 Fig. 108 Block 3
R 71 86 42 — R	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) N1 increased above 103%.
R	2. 71-86-00 Fig. 108 Block 1
71 88 01 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) lights up but maximum TGT appears likely to be exceeded. Starting fuel flow was high. Start aborted at ___degrees C.
	2. 71-88-00 Fig. 103 Block 3
71 88 02 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) lights up but maximum TGT appears likely to be exceeded. Rapid increase in TGT occurred at or below 32% N3. Starting fuel flow normal. Start aborted at ___degrees C.
	2. 71-88-00 Fig. 103 Block 3
71 88 03 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) lights up but maximum TGT appears likely to be exceeded. Rapid increase in TGT occurred above 32% N3. Starting fuel flow normal. GND START switch did not release before 51% N3. Start aborted at ___degrees C.
	2. 71-88-00 Fig. 104 Block 5

EFFECTIVITY: ALL

050B

71-FAULT CODE INDEX

Page 15
Jun 15/95

FAULT CODE INDEX
TABLE 1 (CONTINUED)-----
FAULT
CODE1. LOG BOOK REPORT
2. FAULT ISOLATION REFERENCE

71 88 04 ____

1. (O1=ENG 1, O2=ENG 2, O3=ENG 3) lights up but maximum TGT appears likely to be exceeded. Rapid increase in TGT occurred above 32% N3. VALVE OPEN light went out before 43% N3. Start aborted at ____ degrees C.
2. 71-88-00 Fig. 104 Block 2

71 88 05 ____

1. (O1=ENG 1, O2=ENG 2, O3=ENG 3) lights up but maximum TGT appears likely to be exceeded. Rapid increase in TGT occurred above 32% N3. GND START switch released before 51% N3. Start aborted at ____ degrees C.
2. 71-88-00 Fig. 104 Block 4

71 88 06 ____

1. (O1=ENG 1, O2=ENG 2, O3=ENG 3) TGT above 600 degrees C but not more than 725 degrees C for up to 2 minutes. Record exact TGT ____ deg. C and duration of O/temp ____ (minutes)(seconds).
2. 71-88-00 Fig. 106 Block 2

71 88 07 ____

1. (O1=ENG 1, O2=ENG 2, O3=ENG 3) TGT above 600 degrees C but not more than 725 degrees C for longer than 2 minutes. Record exact TGT ____ deg. C and duration of O/temp ____ (minutes)(seconds).
2. 71-88-00 Fig. 106 Block 4

71 88 08 ____

1. (O1=ENG 1, O2=ENG 2, O3=ENG 3) TGT above 725 degrees C but not more than 950 degrees C for up to 5 seconds. Record exact TGT ____ deg. C and duration of O/temp ____ (seconds).
2. 71-88-00 Fig. 107 Block 3

R EFFECTIVITY: ALL

R
050B

71-FAULT CODE INDEX

Page 16
Jun 15/95

FAULT CODE INDEX TABLE 1 (CONTINUED)

FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE
71 86 09 ____	(01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 725 degrees C but not more than 950 degrees C for longer than 2 minutes. Record exact TGT ____ deg. C and duration of 0/temp ____ (minutes)(seconds). 71-88-00 Fig. 107 Block 5
71 88 10 ____	(01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 950 degrees C. Record exact TGT ____ deg. C and duration of 0/temp ____ (minutes)(seconds). 71-88-00 Fig. 107 Block 4
71 88 11 ____	(01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 550 degrees C but not more than 600 degrees C for up to 1 minute. Record exact TGT ____ deg. C and duration of 0/temp ____ (seconds). 71-88-00 Fig. 105 Block 3
71 88 12 ____	(01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 550 degrees C but not more than 600 degrees C for longer than 1 minute but not longer than 2 minutes. Record exact TGT ____ deg. C and duration of 0/temp ____ (minutes)(seconds). 71-88-00 Fig. 105 Block 9
71 88 13 ____	(01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 550 degrees C but not more than 600 degrees C for longer than 2 minutes. Record exact TGT ____ deg. C and duration of 0/temp ____ (minutes)(seconds). 71-88-00 Fig. 105 Block 5
71 89 01 ____	(01=ENG 1, 02=ENG 2, 03=ENG 3) TGT high. EPR reduced to keep TGT within limits. Fuel flow indication high for EPR obtained. 71-89-00 Fig. 108 Block 7

R
R
050B

EFFECTIVITY: ALL

71-FAULT CODE INDEX

Page 17
Jun 15/95

FAULT CODE INDEX
TABLE 1 (CONTINUED)

FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE
71 89 02 —	1. (O1=ENG 1, O2=ENG 2, O3=ENG 3) TGT high. EPR reduced to keep TGT within limits. Fuel flow indication normal for EPR obtained. 2. 71-89-00 Fig. 108 Block 1
71 89 03 —	1. (O1=ENG 1, O2=ENG 2, O3=ENG 3) TGT indication reads low/zero. 2. 71-89-00 Fig. 107 Block 1
71 89 04 —	1. (O1=ENG 1, O2=ENG 2, O3=ENG 3) TGT above 750 degrees C but not more than 780 degrees C and was plotted in area C on Overtemp (except start) graph. Record exact TGT ____ deg. C and duration of 0/temp ____ (seconds). 2. 71-89-00 Fig. 105 (Sheet 1) Block 6
71 89 05 —	1. (O1=ENG 1, O2=ENG 2, O3=ENG 3) TGT above 750 degrees C but not more than 780 degrees C and was plotted in area B on Overtemp (except start) graph. Record exact TGT ____ deg. C and duration of 0/temp ____ (seconds). 2. 71-89-00 Fig. 105 (Sheet 1) Block 4
71 89 06 —	1. (O1=ENG 1, O2=ENG 2, O3=ENG 3) TGT above 750 degrees C but not more than 780 degrees C and was plotted in area A on Overtemp (except start) graph. Record exact TGT ____ deg. C and duration of 0/temp ____ (seconds). 2. 71-89-00 Fig. 105 (Sheet 1) Block 2
71 89 07 —	1. (O1=ENG 1, O2=ENG 2, O3=ENG 3) TGT above 780 degrees C but not more than 975 degrees C. Eng was not in stall condition. Record exact TGT ____ deg. C and duration of 0/temp ____ (seconds). 2. 71-89-00 Fig. 106 Block 7

R EFFECTIVITY: ALL

R
050B

71-FAULT CODE INDEX

Page 18
Jun 15/95

FAULT CODE INDEX
TABLE 1 (CONTINUED)

FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE
71 89 08 _	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 780 degrees C but not more than 975 degrees C for up to 5 seconds. Eng was in stall condition. Record exact TGT ____ deg. C and duration of 0/temp ____ (seconds). 2. 71-89-00 Fig. 106 Block 3
71 89 09 _	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 780 degrees C but not more than 975 degrees C for between 5 and 20 seconds. Eng was in stall condition. Record exact TGT ____ deg. C and duration of 0/temp ____ (seconds). 2. 71-89-00 Fig. 106 Block 5
71 89 10 _	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 780 degrees C but not more than 975 degrees C for longer than 20 seconds. Eng was in stall condition. Record exact TGT ____ deg. C and duration of 0/temp ____ (seconds). 2. 71-89-00 Fig. 106 Block 7
71 89 11 _	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 975 degrees C. Eng was not in stall condition. Record exact TGT ____ deg. C and duration of 0/temp ____ (seconds). 2. 71-89-00 Fig. 106 Block 7
71 89 12 _	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 975 degrees C for up to 20 seconds. Eng was in stall condition. Record exact TGT ____ deg. C and duration of 0/temp ____ (seconds). 2. 71-89-00 Fig. 106 Block 5

R EFFECTIVITY: ALL

050B

71-FAULT CODE INDEX

Page 19
Jun 15/95

FAULT CODE INDEX
TABLE 1 (CONTINUED)

FAULT
CODE

1. LOG BOOK REPORT
2. FAULT ISOLATION REFERENCE

- | | |
|---------------|--|
| 71 89 13 ____ | <p>1. (01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 975 degrees C for longer than 20 seconds. Eng was in stall condition. Record exact TGT ____ deg. C and duration of 0/temp ____ (seconds).</p> <p>2. 71-89-00 Fig. 106 Block 7</p> |
| 71 89 14 ____ | <p>1. (01=ENG 1, 02 =ENG 2, 03=ENG 3) TGT above 738 degrees C but not more than 743 degrees C for up to 20 seconds. Record exact TGT ____ deg. C and duration of 0/temp ____ (seconds).</p> <p>2. 71-00-00 No maintenance action required.</p> |
| 71 89 15 ____ | <p>1. (01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 738 degrees C but not more than 743 degrees C for longer than 20 seconds but not longer than 2 minutes. Record exact TGT ____ deg. C and duration of 0/temp ____ (seconds).</p> <p>2. 71-89-00 Fig. 104 (Sheet 2) Block 5</p> |
| 71 89 16 ____ | <p>1. (01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 738 degrees C but not more than 743 degrees C for longer than 2 minutes. Record exact TGT ____ deg. C and duration of 0/temp ____ (minutes)(seconds).</p> <p>2. 71-89-00 Fig. 104 (Sheet 2) Block 2</p> |
| 71 89 17 ____ | <p>1. (01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 743 degrees C but not more than 750 degrees C for up to 20 seconds. Record exact TGT ____ deg. C and duration of 0/temp ____ (seconds).</p> <p>2. 71-00-00 No maintenance action required.</p> |

R
R

EFFECTIVITY: ALL

0508

71-FAULT CODE INDEX

Page 20
Jun 15/95

FAULT CODE INDEX
TABLE 1 (CONTINUED)

FAULT
CODE

1. LOG BOOK REPORT
2. FAULT ISOLATION REFERENCE

71 89 18 ____

1. (01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 743 degrees C but not more than 750 degrees C for longer than 20 seconds but not longer than 2 minutes. Record exact TGT ____ deg. C and duration of 0/temp ____ (seconds).
2. 71-89-00 Fig. 104 (Sheet 3) Block 5

71 89 19 ____

1. (01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 743 degrees C but not more than 750 degrees C for longer than 2 minutes. Record exact TGT ____ deg. C and duration of 0/temp ____ (minutes)(seconds).
2. 71-89-00 Fig. 104 (Sheet 3) Block 2

71 89 20 ____

1. (01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 728 degrees C but not more than 738 degrees C for up to 2 minutes. Record exact TGT ____ deg. C and duration of 0/temp ____ (minutes)(seconds).
2. 71-00-00 No maintenance action required.

71 89 21 ____

1. (01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 700 degrees C but not more than 710 degrees C for up to 5 minutes. Record exact TGT ____ deg. C and duration of 0/temp ____ (minutes)(seconds).
2. 71-00-00 No maintenance action required.

71 89 22 ____

1. (01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 700 degrees C but not more than 710 degrees C for between 5 and 10 minutes. Record exact TGT ____ deg. C and duration of 0/temp ____ (minutes)(seconds).
2. 71-89-00 Fig. 103 (Sheet 1) Block 5

R
R
0508

EFFECTIVITY: ALL

71-FAULT CODE INDEX
Page 21
Jun 15/95

FAULT CODE INDEX TABLE 1 (CONTINUED)

FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE
71 89 23 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 700 degrees C but not more than 710 degrees C for longer than 10 minutes. Record exact TGT ____ deg. C and duration of 0/temp ____ (minutes)(seconds). 2. 71-89-00 Fig. 103 (Sheet 1) Block 2
71 89 24 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 710 degrees C but not more than 728 degrees C for between 5 and 10 minutes. Record exact TGT ____ deg. C and duration of 0/temp ____ (minutes)(seconds). 2. 71-89-00 Fig. 103 (Sheet 2) Block 5
71 89 25 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 710 degrees C but not more than 728 degrees C for longer than 10 minutes. Record exact TGT ____ deg. C and duration of 0/temp ____ (minutes)(seconds). 2. 71-89-00 Fig. 103 (Sheet 1) Block 2
71 89 26 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 728 degrees C but not more than 738 degrees C for between 2 and 5 minutes. Record exact TGT ____ deg. C and duration of 0/temp ____ (minutes)(seconds). 2. 71-89-00 Fig. 104 (Sheet 1) Block 5
71 89 27 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 728 degrees C but not more than 738 degrees C for longer than 5 minutes. Record exact TGT ____ deg. C and duration of 0/temp ____ (minutes)(seconds). 2. 71-89-00 Fig. 104 (Sheet 1) Block 2
71 89 28 00	1. NOT USED.
71 89 29 00	1. NOT USED.
71 89 30 00	1. NOT USED.

R EFFECTIVITY: ALL

0508

71-FAULT CODE INDEX

Page 22
Jun 15/95

FAULT CODE INDEX
TABLE 1 (CONTINUED)

FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE
71 89 31 00	1. NOT USED.
71 89 32 00	1. NOT USED.
71 89 33 00	1. NOT USED.
71 89 34 00	1. NOT USED.
71 89 35 00	1. NOT USED.
71 89 36 00	1. NOT USED.
71 89 37 00	1. NOT USED.
71 89 38 00	1. NOT USED.
71 89 39 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) TGT above 710 degrees C but not more than 728 degrees C for up to 5 minutes. Record exact TGT ____ deg. C and duration of 0/temp ____ (minutes)(seconds). 2. 71-00-00 No maintenance action required.
71 91 01 00	1. NOT USED.
71 91 02 00	1. NOT USED.
71 91 03 00	1. NOT USED.
71 91 04 00	1. NOT USED.
71 91 05 00	1. NOT USED.
71 91 06 00	1. NOT USED.
71 91 07 —	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) experienced a sudden increase in vibration from ____ to ____ unit(s) with (Fan/A), (Turb/B) selected. Warning light was (on) (off). 2. 71-91-00 Fig. 103 Block 1

R EFFECTIVITY: ALL

050B

71-FAULT CODE INDEX

Page 23
Jun 15/95

FAULT CODE INDEX TABLE 1 (CONTINUED)

FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE
71 91 08 00	- Abnormal Aft Cabin Vibration above WARNING level. 71-91-00 Fig. 103 Block 1
71 91 09 00	- Abnormal Aft Cabin Vibration below WARNING level. 51-00-00 Fig. 102 Block 1 29-11-00 Fig. 105 Block 2 24-11-00 Fig. 106 Block 1 32-10-00 Fig. 103 Block 1 32-20-00 Fig. 103 Block 1 71-91-00 Fig. 104 Block 2
71 91 10 —	(01=ENG 1, 02=ENG 2, 03=ENG 3) experienced a slow increase in vibration from — to — unit(s) in — (time) with (Fan/A), (Turb/B) selected. Warning light was (on) (off). 71-91-00 Fig. 103 Block 1
71 93 01 —	(01=ENG 1, 03=ENG 3) surged (stalled) during takeoff. 71-93-00 Fig. 101 Block 1
71 93 02 —	(02=ENG 2) surged (stalled) during takeoff. Surge occurred during freezing rain or snow conditions. Aircraft was de-iced prior to takeoff. 71-93-00 Fig. 101 Block 1
71 93 03 —	(02=ENG 2) surged (stalled) during takeoff. Surge occurred during freezing rain or snow conditions. Aircraft was not de-iced prior to takeoff. 71-93-00 Fig. 101 Block 1

FAULT CODE INDEX
TABLE 1 (CONTINUED)

FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE
71 93 04 _	1. (02=ENG 2) surged (stalled) during takeoff. Surge did not occur during freezing rain or snow conditions. 2. 71-93-00 Fig. 101 Block 1
71 93 05 _	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) surged (stalled) during flight. 2. 71-93-00 Fig. 102 Block 1
71 95 01 _	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) OVHT light and TURB AIR OVHT light on when eng running. All other indications normal. (Ref. Chapter 77 for Fault Code diagram.) 2. 71-95-00 Fig. 101 Block 2
71 95 02 _	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) OVHT light and TURB AIR OVHT light on when eng running. A change in indicated vibration was observed. (Ref. Chapter 77 for Fault Code diagram.) 2. 71-95-00 Fig. 101 Block 4
71 99 01 _	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) encountered an actual or suspected bird strike. Eng did not surge and there were no indications of eng malfunction. 2. 71-99-00 Fig. 101 Block 1
71 99 02 _	1. (01=ENG 1, 02=ENG 2, 03=ENG 3) encountered an actual or suspected bird strike. Eng did not surge but there were the following indications of eng malfunction _ _ _ _. 2. 71-99-00 Fig. 102 Block 1

R EFFECTIVITY: ALL

050B

71-FAULT CODE INDEX

Page 25
Jun 15/95

FAULT CODE INDEX
TABLE 1-----
FAULT
CODE

1. LOG BOOK REPORT
-
2. FAULT ISOLATION REFERENCE
-
-

71 99 03 _

1. (01=ENG 1, 02=ENG 2, 03=ENG 3) encountered an actual or suspected bird strike. Eng surged but there were no other indications of eng malfunction.
2. 71-99-00 Fig. 103 Block 1

71 99 04 _

1. (01=ENG 1, 02=ENG 2, 03=ENG 3) encountered an actual or suspected bird strike. Eng surged and there were the following indications of eng malfunction _ _ _ _.
2. 71-99-00 Fig. 104 Block 1

71 99 05 _

1. (01=ENG 1, 02=ENG 2, 03=ENG 3) encountered an actual or suspected bird strike. Eng did not surge and there were no indications of eng malfunction but there was an unusual cabin odor.
2. 71-99-00 Fig. 101 Block 1

71 99 06 _

1. (01=ENG 1, 02=ENG 2, 03=ENG 3) encountered an actual or suspected bird strike. Eng did not surge but there were the following indications of eng malfunction____and an unusual cabin odor.
2. 71-99-00 Fig. 102 Block 1

LOCKHEED



MAINTENANCE MANUAL

POWER PLANT - DESCRIPTION AND OPERATION

1. General

The Lockheed Tristar is powered by three Rolls-Royce RB.211 propulsion systems. Two of the propulsion systems are suspended from pylons, one beneath each wing, zones 410 and 420 (Ref. Fig. 1 and 2), and the third propulsion system is suspended in a bay at the rear of the fuselage, zone 430. Airflow to the fuselage propulsion system is through a duct that extends aft and downward from an intake above the fuselage. The propulsion systems are numbered 1 to 3, from left to right as viewed from the rear.

Each propulsion system is attached to the aircraft by two mounts (Ref. 71-20-00) positioned in tandem along the top of the engine. The front mount transmits engine thrust, vertical, and side loads to the airframe structure. The rear mount transmits vertical, side, and torsional loads to the airframe structure.

Each propulsion system (Ref. Fig. 3 and 4) comprises an engine (Ref. 72-00-00), exhaust system (Ref. 78-00-00), accessories, and all parts peculiar to its allocated position.

R The engine is a high bypass ratio turbofan featuring a single stage low-pressure (LP) compressor (fan driven by a three-stage turbine, a seven-stage intermediate-pressure (IP) compressor and a six-stage high-pressure (HP) compressor combustion system. Each rotating assembly is mechanically independent of the other two. The exhaust system comprises a cold stream collector and nozzle, incorporating a thrust reverser system, and a hot stream collector and nozzle.

A low pressure pneumatic starter (Ref. Fig. 1) is fitted to each propulsion system. The starter drive is geared through the high-speed (HS) external gearbox to the compressor shaft. Air for starting all propulsion systems can be obtained from an external supply, from the aircraft APU, or by crossfeeding from an engine that is running (Ref. 71-00-00).

An integrated drive generator (IDG) assembly, and hydraulic pump(s) are fitted to the HS external gearbox of each propulsion system (Ref. Fig. 2). The IDG units provide electrical power (Ref. 24-21-00) for the propulsion system and for aircraft services. The hydraulic pumps, one fitted to each wing-mounted propulsion system and two to the fuselage-mounted propulsion system, supply the hydraulic power (Ref. 29-11-00) for certain aircraft services.

EFFECTIVITY: ALL

001B

71-00-00

Page 1
Dec 15/80

LOCKHEED
MAINTENANCE MANUAL

The engine inlet of each propulsion system is anti-iced by a self-contained system (Ref. 30-21-00) fed with hot air bled from the IP compressor. Air bled from the HP and IP compressor systems is also used for other propulsion system and various aircraft services (Ref. 75-00-00).

To minimize under cowl temperatures and prevent the accumulation of inflammable vapors, each propulsion system is divided into five ventilated zones (Ref. 75-21-00). The accessory compartment, zone 1, is ventilated by ram air when the aircraft is airborne and the remaining zones are ventilated by LP compressor outlet air.

Firewalls, fireseals, flame break-out shields and structures made from fire resistant metals (Ref. 72-30-00), localize the zones and isolate the engine from the remainder of the aircraft in the event of fire.

A fire detection system (Ref. 26-11-00), provides a visual and an audible warning at the flight station in the event of an overheat or fire condition around the engine. A fire extinguishing system (Ref. 26-21-00) comprising a single multispray nozzle, located at the top of the accessories compartment, is supplied with an extinguishing agent from two containers. The containers are located in the nose cowl on wing propulsion systems and in a compartment forward of the engine bay on the fuselage propulsion system.

Each propulsion system incorporates a drains system (Ref. 71-70-00) that collects and disposes inflammable fluids from accessory units, and from the combustion system following engine shutdown. The fluids are either ejected directly overboard through vents, or collected in containers that empty automatically.

Power control in forward and reverse thrust, and selection of reverse thrust, are accomplished from the flight station (zone 210) through a throttle lever and reverse thrust select (Ref. 76-00-00) to the fuel flow regulator (Ref. 73-21-00) and the thrust reverser selector valve (Ref. 78-30-00). Fuel control for starting and stopping is controlled by a HP fuel shutoff valve (Ref. 73-11-00) that is energized from a fuel and ignition switch at the flight station (zone 210).

Hinged cowls, doors and removable panels (Ref. 6-40-00), allow access for servicing and for the removal and installation of units. Push-in fire access panels are also provided for the insertion of ground fire fighting equipment. Apertures in the cowlings provide for the inlets and outlets of various engine systems, these are illustrated in Fig. 5 for wing propulsion systems.

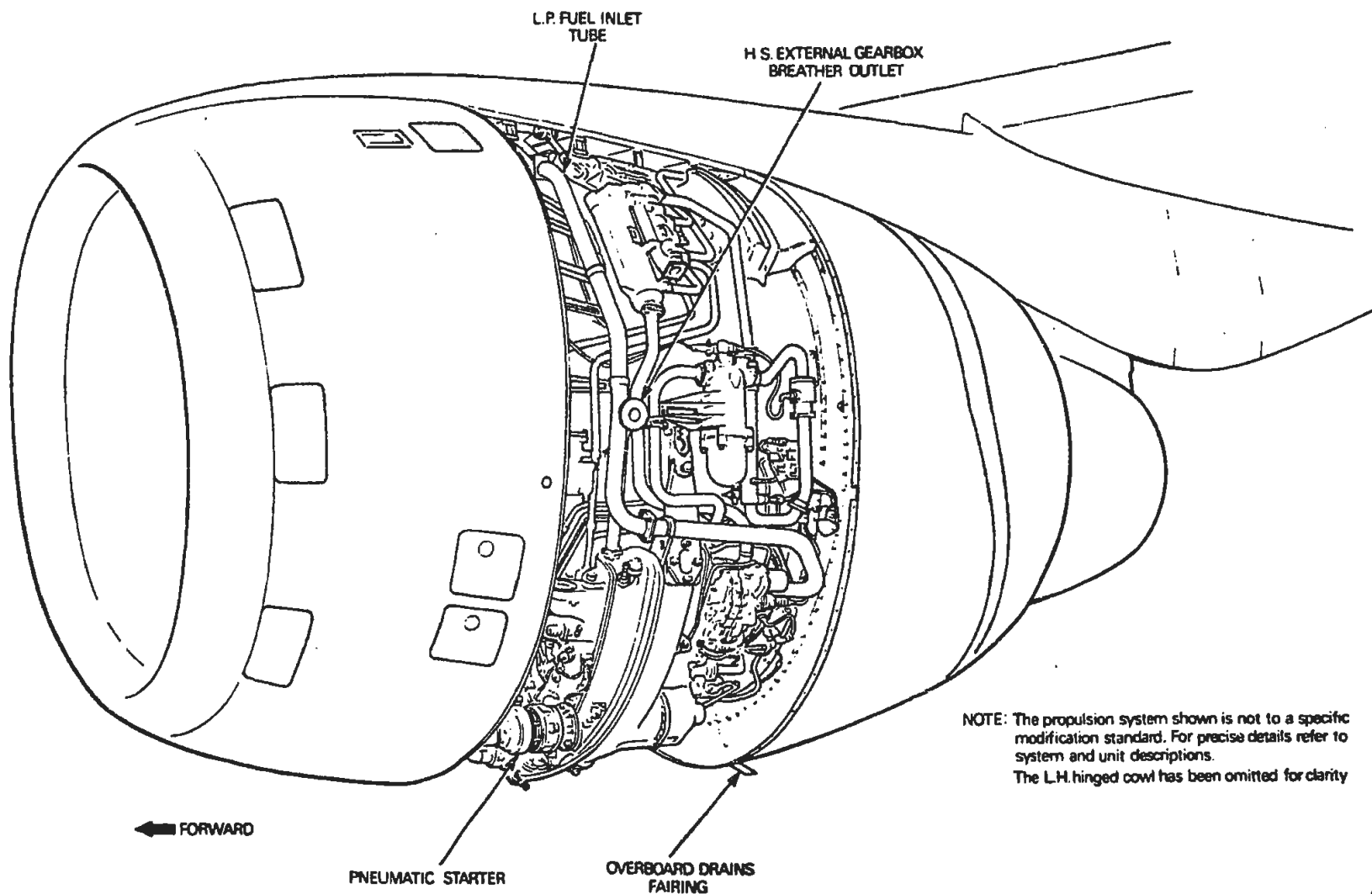
R
R

001B

EFFECTIVITY: ALL

71-00-00

Page 2
Dec 15/80

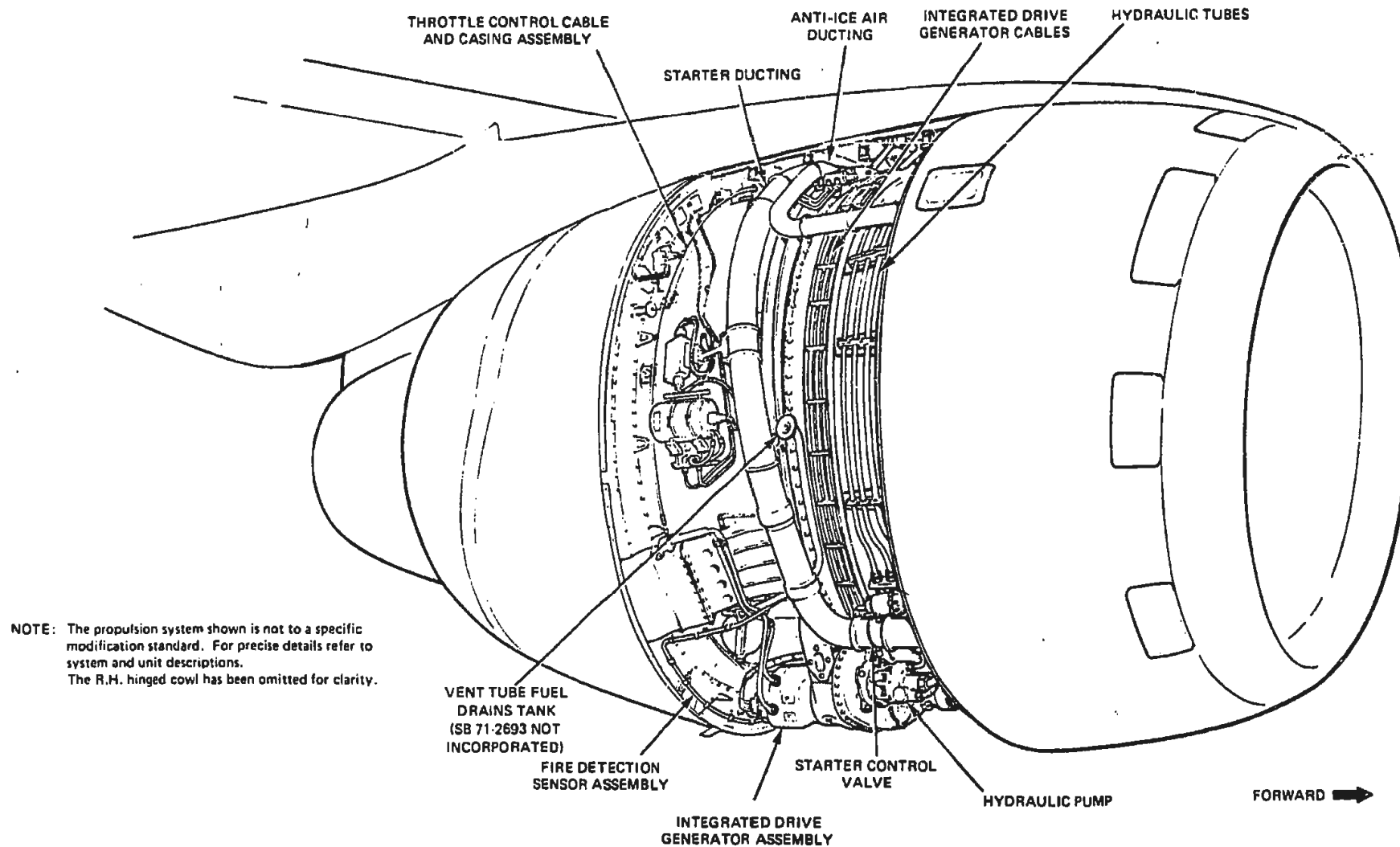


Wing Mounted Propulsion System LH View
Figure 1

EFFECTIVITY: ALL

71-00-00
Page 3/4
Aug 15/81

M1-0002-71-006
24222A



M 1-0002-71-007
24223A

R
R

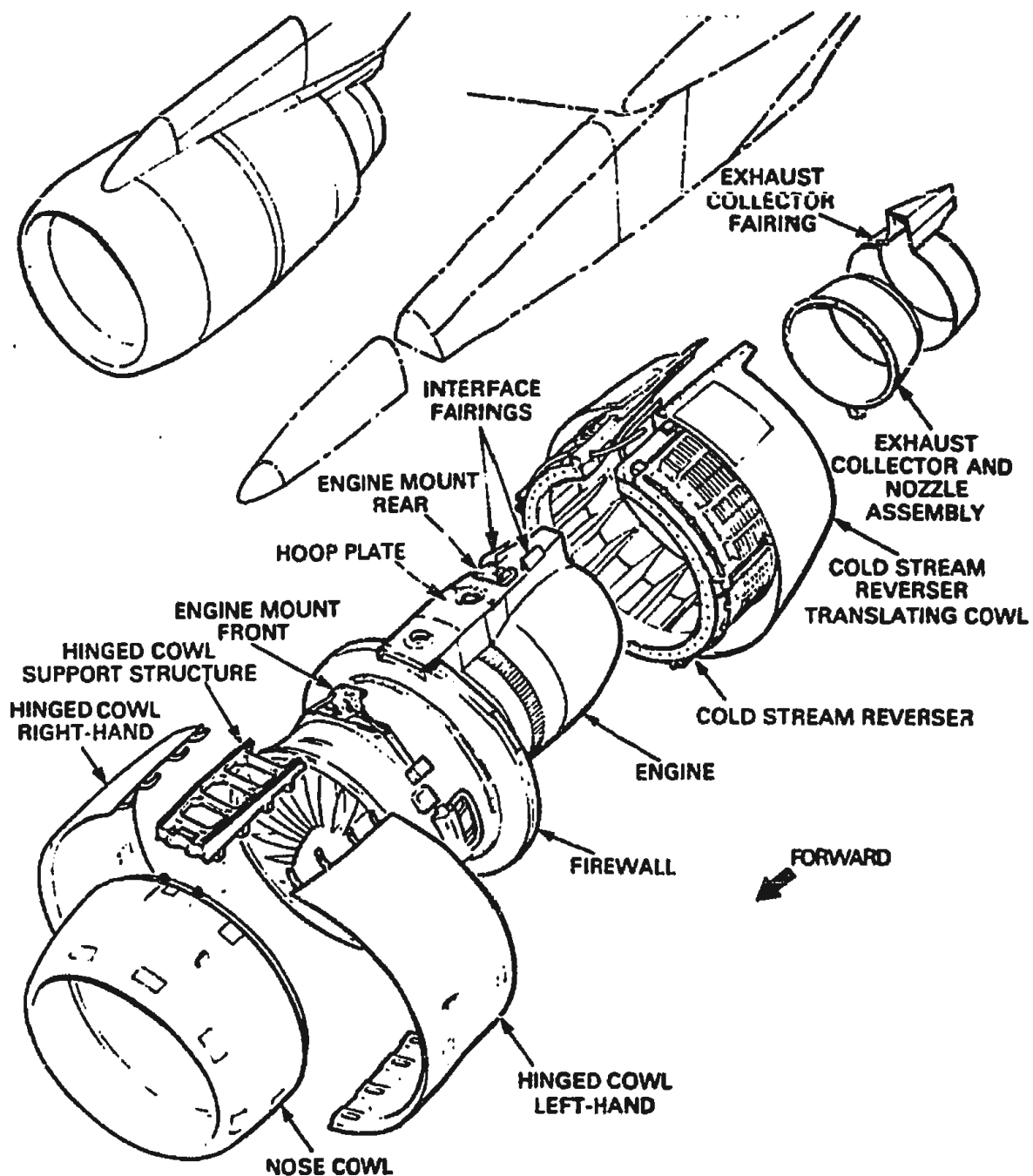
Wing Mounted Propulsion System RH View
Figure 2

EFFECTIVITY: ALL

71-00-00
Page 5/6
Aug 15/81

001R

LOCKHEED
MAINTENANCE MANUAL



34088
M1-30000-71-033

Wing Mounted Propulsion System Major Units
Figure 3

R
R

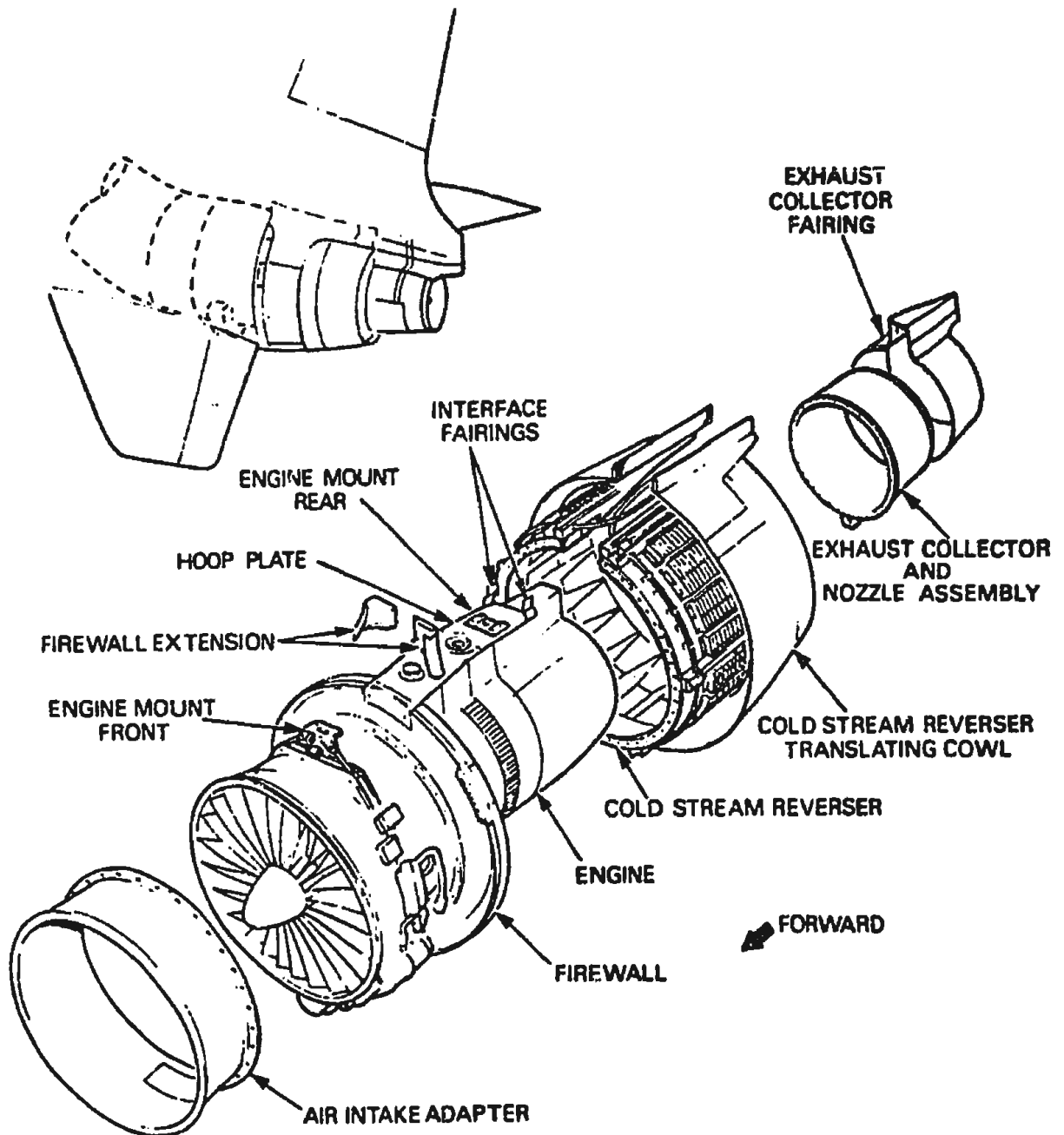
EFFECTIVITY: ALL

0018

71-00-00

Page 7
Dec 15/80

LOCKHEED
MAINTENANCE MANUAL



24685C
M1-0102-71-006

R
R

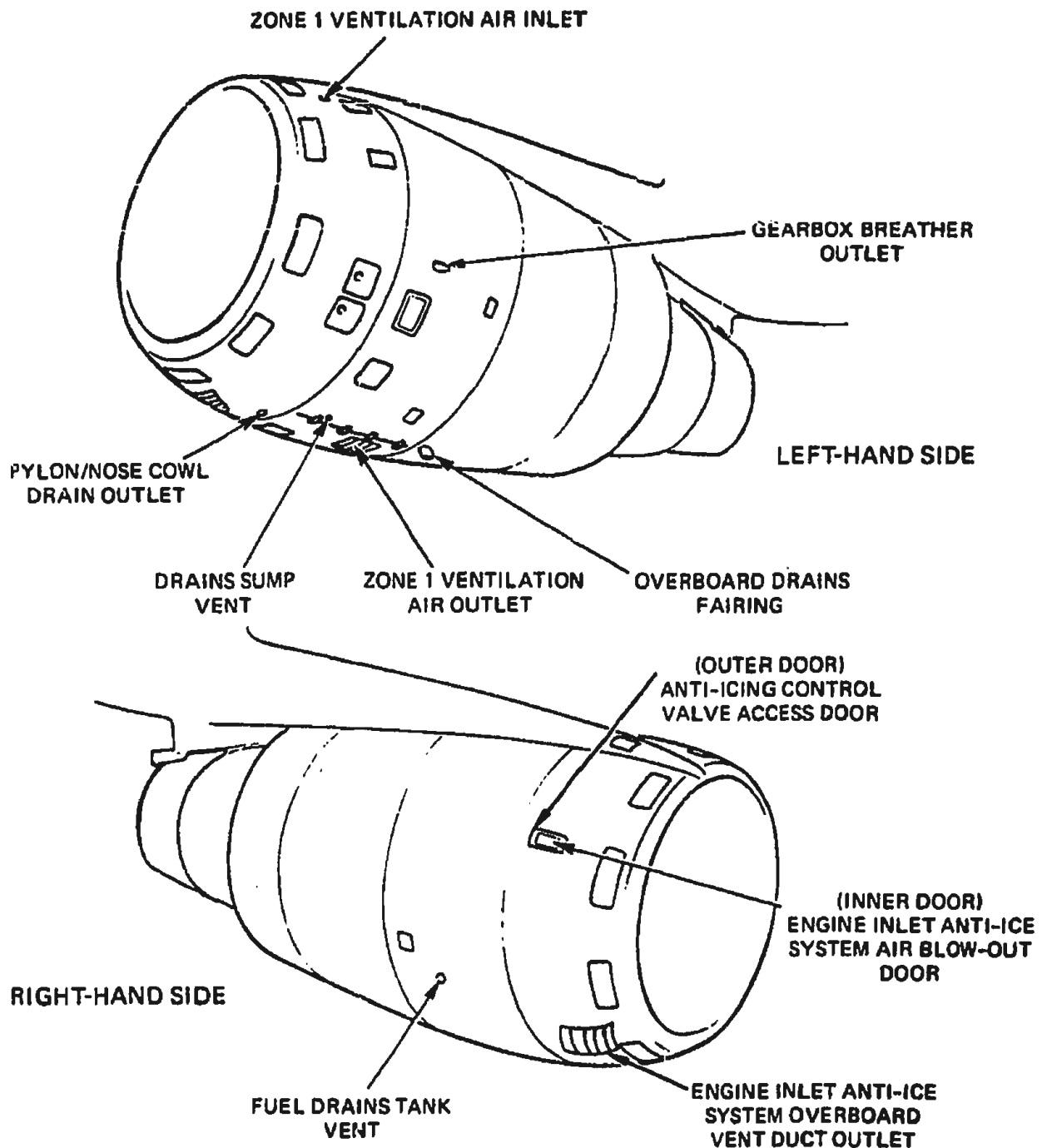
Fuselage Mounted Propulsion System Major Units
Figure 4

EFFECTIVITY: ALL

001B

71-00-00
Page 8
May 15/78

LOCKHEED
MAINTENANCE MANUAL



M1-0002-71-009
24753A

R
R

Wing Mounted Propulsion System Inlets and Outlets
Figure 5

EFFECTIVITY: ALL

001B

71-00-00
Page 9
Aug 15/81



MAINTENANCE MANUAL

On removal and prior to installation, an engine complete with exhaust system accessories and positional items, is termed a quick engine change (QEC) unit.

The weights and dimensions of a wing and fuselage QEC unit given below are approximate figures for handling information only and do not represent any specific modification standard.

R	Wing QEC Unit (No. 1 and 3 position)		
R	Weight	13,090 lbs (5937 kg)	
R		(without RR SB78-2969)	
R	Weight	12,809 lbs (5810 kg)	
R		(with RR SB78-2969)	
R	Length	254 in. (6450 mm)	
R		(without RR SB78-2969)	
R	Length	250 in (6340 mm)	
R		(with RR SB78-2969)	
R	.. Diameter	107 in. (2720 mm)	
R	Fuselage QEC Unit (No. 2 position)		
R	Weight	12,580 lbs (5705 kg)	
R		(without RR SB78-2969)	
R	Weight	12,299 lbs (5579 kg)	
R		(with RR SB78-2969)	
R	Length	220 in. (5590 mm)	
R		(without RR SB78-2969)	
R	Length	216 in. (5480 mm)	
R		(with RR SB78-2969)	
R	Diameter	107 in. (2720 mm)	

A propulsion system and QEC unit are defined as follows:

A propulsion system is a wing or fuselage QEC unit installed in its correct position in the aircraft with all engine and aircraft systems connected, and panels fitted.

Wing QEC unit (No. 1 and No. 3 engine) is an engine prepared and ready for installation, complete with exhaust system, nose cowl, accessories, systems, and all parts peculiar to its allocated installation position, but less the hinged cowl side panels and their support structure.

Fuselage QEC unit (No. 2 engine), is an engine prepared and ready for installation, complete with exhaust system, accessories, systems and all parts peculiar to its allocated installation position.

CHAPTER 71POWER PLANT

CR TROUBLESHOOTING - USING AIDS

CR 1. Using AIDS for engine test and troubleshooting

CR A. General

CR (1) Good maintenance practices require that AIDS recording be
 CR made during engine runups for tests or troubleshooting.
 CR Also make AIDS recordings of unusual happenings (stall,
 CR overtemp., fire and etc.) should they occur during
 CR maintenance engine run.

CR B. Procedure for making AIDS recordings:

CR (1) Assure that AIDS has electrical power.

CR (a) The circuit breakers must be in.

CR NOTE: There are 4, and they are on the F/E's aft
 CR panel (CB-3) in H (10, 11, 12, 13) labeled
 CR AIDS DC AO BO CO.

CR (b) Master radio switches ON.

CR (2) Setting up the AIDS control unit at the F/E's panel.
 CR See Figure 102.

CR (a) Set in the month and day. Disregard gross weight.

CR (b) For identification of the station making the AIDS
 CR recording, set numbers in the windows for flight
 CR and leg per the following:

CR MCI, all 5's SFO, all 8's

CR JFK, all 6's LAX, all 9's

CR ORD, all 7's

EFFECTIVITY: ALL

050B

1G

71-00-00
 Page 101
 Mar 15/84



RB.211 Propulsion System

MAINTENANCE

- CR (c) Disregard pilot identification.
- CR (d) Position the system select dial to ENGINE and the
CR sub-system select dial to the number which indicates
CR the applicable engine. If date is of equal
CR importance for all engines, set sub-system to 0.

CR NOTE: Do not set system select to ALL if only
CR engine data is desired as this would incur
CR unnecessary processing costs.

CR (3) AIDS Activation.

CR (a) Normal Activation.

CR Any fuel/ignition switch in the ON position will
CR activate AIDS, so when any engine is running AIDS
CR is activated. If it is desired to make a
CR recording with all engines shut down, pull the
CR C/B's (any engine) for the fuel shut-off valve,
CR and B ignition on the CB-1 panel and A ignition
CR on the CB-3 panel. Position the corresponding
CR fuel/ignition switch to ON.

CR (b) Alternate Activation of AIDS.

CR AIDS can also be activated by positioning the
CR override switch to AIDS ONLY. This switch is
CR at the AIDS rack in the FESC, See Fig.101.

CR NOTE: Usually the override switch is only used
CR when making a self-test. See instructions
CR for AIDS self-test under AIDS information
CR which follows this procedure.

CR Remember, if the AIDS is activated using
CR this override switch, AIDS will continue to
CR run after the fuel/ignition switches are
CR turned OFF and any record that is on the
CR loop recorder is lost after 5 minutes.
CR To save this record push the manual record
CR button at shutdown or pull the AIDS C/B's
CR and then make the manual recording later
CR if desired.

EFFECTIVITY: ALL

050B

16

71-00-00

Page 102
Mar 15/84



RB.211 Propulsion System MAINTENANCE

**INTENTIONALLY
LEFT BLANK**

MI-000-SP-1LB

CR
CR

**Forward Electronic Service Compartment
Figure 101**

R
R
050B

EFFECTIVITY: ALL

1G

71-00-00
Page 103
Mar 15/84



RB.211 Propulsion System

MAINTENANCE

CR (4) Push the MANUAL RECORD switch to make manual recording.

CR NOTE: AIDS records data for the 5 minutes of operation
CR just prior to pushing the MANUAL RECORD switch.
CR Anything that happens after the switch is pushed
CR will not be recorded. For continuous recording
CR push the MANUAL RECORD switch at intervals of
CR less than 5 minutes. Four-minute intervals are
CR suggested.

CR (5) When the manual recording has been completed and before
CR leaving the aircraft, return the OVERRIDE switch and/or
CR circuit breakers and fuel/ignition switches to normal
CR positions.

CR 2. AIDS - Making Manual Recordings - General Information

CR A. When the AIDS system is activated, data is continuously being
CR put on the CLR (Continuous Loop Recorder) tape and being
CR erased at a point which always leaves the last five minutes
CR of data on the loop tape. Push the MANUAL RECORD switch
CR and the last five minutes of data that was put on the loop
CR is transferred to the IR (Increments Recorder) cartridge tape.

CR B. To make continuous manual recordings, with AIDS system
CR activated, push the MANUAL RECORD switch at intervals not
CR to exceed five minutes.

CR NOTE: Record all important data but to avoid unnecessary
CR data processing costs do not record unimportant data.

CR C. If AIDS is activated in the normal manner, ie with a
CR fuel/ignition switch, when all engines are shut down the
CR AIDS will become deactivated in about forty-five seconds.
CR Delay switch causes this forty-five second delay. This will
CR leave the last five minutes of engine operation on the CLR.
CR This data can be transferred to the IR any time later by
CR activating AIDS and pushing the MANUAL RECORD button. This
CR can be useful in a situation where all engines are shut down
CR hurriedly because of an unusual incident and in the haste AIDS
CR is forgotten. Go back any time later, re-activate AIDS,
CR push the MANUAL RECORD and the data for the last five minutes
CR of engine operation prior to shut down will be transferred
CR to the IR (Removeable tape). Don't forget though, if an
CR engine is started, AIDS is activated and the latter record
CR will be lost unless you push MANUAL RECORD when the engine
CR is started.

R EFFECTIVITY: ALL

R
050B

1G

71-00-00

Page 104
Mar 15/84



RB.211 Propulsion System

MAINTENANCE

CR D. The flight recorder is a loop recorder with a twenty-five
CR hour tape. FAA rules that the last twenty-four hours of
CR flight data must be on the tape. This allows one hour for
CR flight recorder maintenance tests. DO NOT USE THE FLIGHT
CR RECORDER for activating the AIDS system.

CR 3. AIDS - Self Test

CR At the AIDS rack in the FESC, position the AIDS override switch
CR to AIDS ONLY, (see Figure 101) and continue with the following
CR (see Figure 103).

CR A. Depress the lamp test switch. Not only will this test each
CR of the test lamps but will also indicate that system is
CR powered.

CR B. Depress the self test switch. A fault in any unit(s) will
CR be indicated by illumination of the applicable lamp.

CR NOTE: Report any fault to AIDS electronic personnel.

CR C. Depress the GMT DISP (display) switch for GMT (Z time)
CR readout. If not correct Z time, reset.

CR D. Unless planning to make manual recordings of engine tests
CR (or other), return the override switch to OFF.



RB.211 Propulsion System

MAINTENANCE

CR 4. GLOSSARY OF ABBREVIATIONS AND TERMS

CR AIDS - Aircraft Integrated Data System

CR FESC - Forward Electrical Service Compartment

CR GMT - Greenwich Mean Time, is also called "Z" time and at

CR JFK equals EST plus 5, or EDT plus 4.

CR ORD equals CST plus 6, or CDT plus 5.

CR LAX equals PST plus 8, or PDT plus 7.

CR SFO equals PST plus 8, or PDT plus 7.

CR MCI equals CST plus 6, or CDT plus 5.

CR NOTE: Use 24 hour clock time.

CR CLR - Continuous loop recorder

CR DFDR - Digital Flight Data Recorder also called Flight Recorder

R EFFECTIVITY: ALL

R
050B

1G

71-00-00
Page 106
Mar 15/84



RB.211 Propulsion System

MAINTENANCE

INTENTIONALLY
LEFT BLANK

MI-000-SP-11B

CR
CR

AIDS Control Unit
Figure 102

R
R
050B

EFFECTIVITY: ALL

1G

71-00-00
Page 107
Mar 15/84



RB.211 Propulsion System

MAINTENANCE

INTENTIONALLY
LEFT BLANK

M1-000-SP-1LB

CEU Front Panel
Figure 103

71-00-00
Page 108
Mar 15/84

C
C
R
R
050B

EFFECTIVITY: ALL

1G

POWER PLANT - MAINTENANCE PRACTICES**1. General**

This procedure contains detailed procedures and limitations for motoring (cranking), starting, handling and stopping the engine, and the checks necessary to verify the engine is running satisfactorily at idle. Also included are the ground running limitations and the action to be taken if limitations are exceeded.

2. Equipment and Materials

Engine Run-up Chain Binder, PN BC 97, or equivalent

Five Brace Chock PN B723, or equivalent

R Slave Oil Pressure Filter, PN 1012117

R Oil Filter Bowl Slave Cover, PN HU30589

R Container - Capacity

R 4.0 U.S. Pints

R 3.0 Imperial Pints

R 2.0 Liters

R Kerosine

R Engine Oil

3. Referenced Procedures

12-12-01 Engine Oil Replenishing

12-12-21 Integrated Drive Generator (IDG) - Oil Replenishing

R 28-24-02 Fuel Boost Pump and Motor - Removal and Installation

36-00-00 Pneumatics - Maintenance Practices

R 49-00-01 Auxiliary Power Unit - Adjustment and Test

R 70-02-01 Identification, Lubrication and Fitting of Rubber Sealing Rings

R 70-51-00 Torque Tightening Techniques

EFFECTIVITY: ALL

001B

71-00-00

Page 201
Jun 15/95



	71-00-00	Power Plant - Adjustment and Test
	71-00-00	Power Plant - Inspection/Check
	71-00-00	Power Plant - Cleaning, Painting and Preservation
R	71-00-04	Engine Ferry - Maintenance Practices
R	71-11-00	Cowlings, Engines No. 1 and No. 3 - Servicing
R	71-12-01	LH and RH Lower Hinged Cows - Servicing
	71-70-00	Engine Drains - Maintenance Practices
R	71-93-00	Surge - Fault Isolation
R	72-00-00	Engine - Inspection/Check
	72-00-00	Rolls-Royce Engine Manual Special Procedure 11
	72-01-00	Oil System - Inspection/Check
R	72-40-00	Combustion Section - Inspection/Check
	72-50-01	Turbine Blades and Vanes - Inspection/Check (Engine Overhaul Manual)
	74-00-00	Ignition - Adjustment/Test
	74-21-02	High-Energy Igniter Plug - Removal/Installation
R	79-00-00	Oil System - Fault Isolation
	80-11-07	Engine Pneumatic Starter - Servicing

4. Ground Running - General Procedures

A. Extent of Ground Running

Ground running should be kept to an absolute minimum. Unnecessary starts, rapid changes in engine condition and prolonged running at maximum conditions should be avoided. Whenever possible, parameter readings should be recorded simultaneously to avoid prolonged running.

C (1) RB211 Oil System Filter Contamination

- C (a) RB211 engines which have not been run for a period
C of time tend to release carbon deposits into the
C oil system. This can result in filters becoming
C clogged with subsequent oil loss and inflight

EFFECTIVITY: ALL

001B

71-00-00

Page 202
Jun 15/95



MAINTENANCE MANUAL

shutdown. While the cause may be controversial, it is generally accepted that carbon forms on the wall of the O3 module. After a period of time of no operation, the carbon dries and flakes off into the oil system. During routine operation, that area is washed with oil; and carbon does not tend to shed.

(b) Unfortunately, this cycle is unpredictable and can depend on climatic conditions, O3 module time, and aircraft out-of-service time. Past experience indicates that aircraft which are out of service four (4) days or more tend to shed carbon and need to be run at high power to stimulate carbon release from the oil system.

(c) This check is listed in the Maintenance Manual as Test 17 - Oil System Filter Contamination Test. Additionally, it is covered on M11-79-03. Also the check is covered by Computer Alert Message on Aircraft Out of Service Four days or More. In spite of these follow ups, occasionally this check gets overlooked. Do not disregard the check -- if in doubt, do the check. This is an important check; do not short-cut the procedure. It should be accomplished using M11-79-03 on L1011 aircraft out of service (which have not been flown) four days or more -- preferably, within four to eight hours of departure time.

B. Safety Precautions

Precautions are necessary to ensure that the engine does not ingest any material or equipment which will cause damage or affect performance and also to ensure personnel working in the vicinity of propulsion system during ground running are aware of the danger areas (Ref. Fig. 201).

(1) Run only one engine at a time to full power. Head aircraft into wind [if impracticable refer to Paragraph C(3)] and position well clear of other aircraft and buildings, paying particular attention to the area behind the engine exhausts.

(2) Apply brakes, ensure that accumulator pressure is normal and wheel chocks are in position.

Lock wheel chocks in place with chain binders.

(3) Clean the ground run area, 40 ft either side of propulsion system center line to 60 ft forward from rear of propulsion system, and inspect to ensure that

R EFFECTIVITY: ALL

001B

71-00-00
Page 203
Jun 15/95



all debris has been cleared and that there are no signs of surface break up.

- (4) Position ground equipment outside the danger areas (Ref. Fig. 201) and ensure that no unauthorized personnel or vehicles can enter the area.
- (5) Ensure ground fire extinguisher equipment is in position and manned.
- (6) Remove air intake and other covers from the propulsion system to be started.
- (7) Ensure air intakes and exhausts are free from foreign objects.
- (8) Ensure that personnel working in the vicinity of the propulsion system do not have loose articles attached to clothing.
- (9) Propulsion system hinged cowls should normally be closed during engine running but may be left open when required at idling speed for specific tests, adjustments and leak checks.

C. Engine Handling

(1) Power Control

Ground running should be restricted to the absolute minimum power level and duration necessary. Rapid movement of throttle levers, except when carrying out acceleration or deceleration tests, is undesirable as this causes rapid temperature changes which adversely affect engine life.

(2) Cross Wind Conditions

- (a) Engine ground running at mid high power in adverse wind conditions (e.g. gusty, cross wind, turbulent) may result in fluctuating parameters (EPR TGT RPM) and, if conditions are sufficiently severe, in an audible roaring noise from the air intake.
- (b) Engine running in such conditions is not recommended. If the onset on intake roar is suspected, power should be reduced immediately, since it is an unstable condition that may result in engine compressor surge.

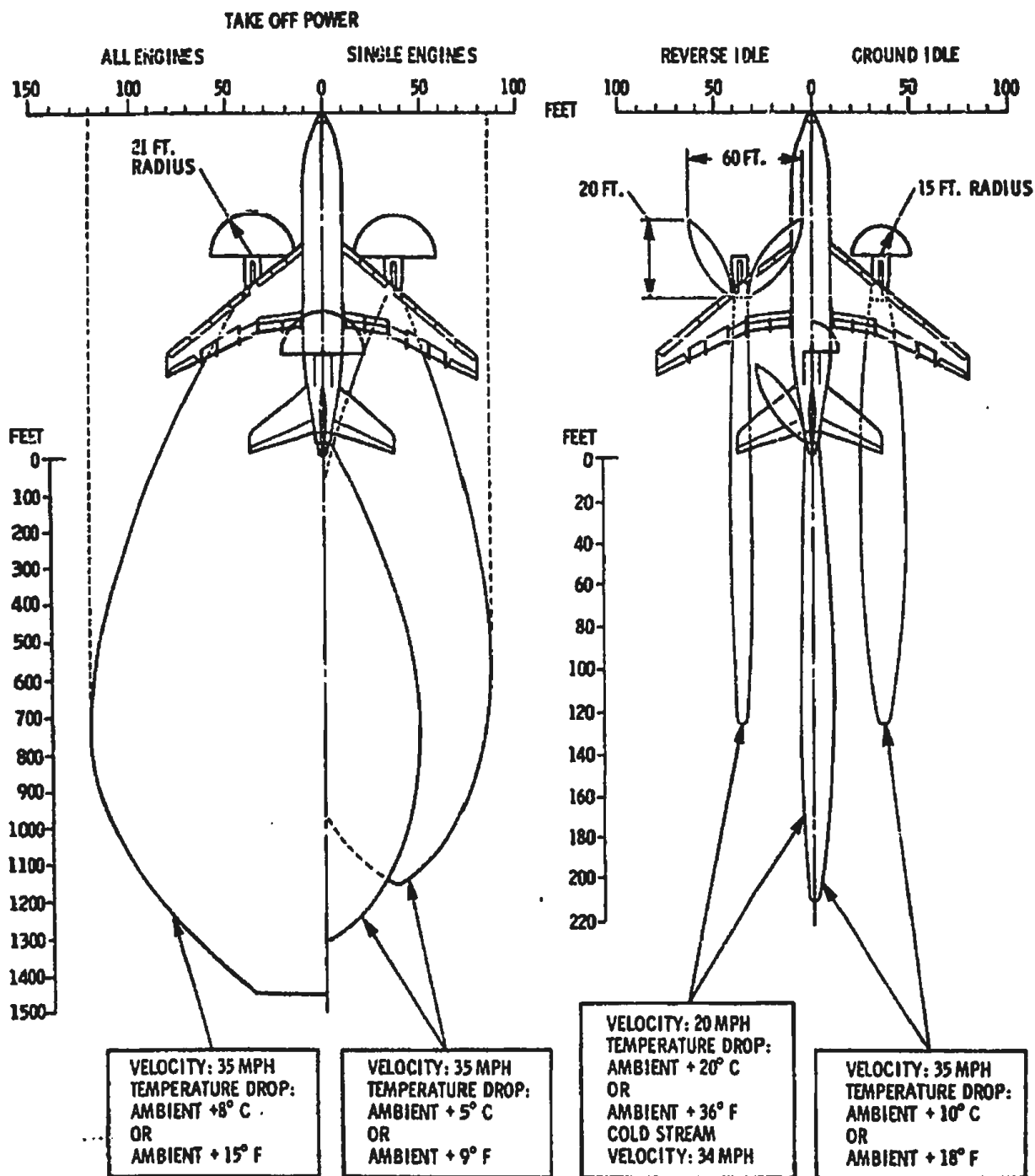
(3) Compressor Surge

R EFFECTIVITY: ALL

0018

71-00-00
Page 204
Jun 15/95

LOCKHEED
MAINTENANCE MANUAL



50175

M1-0003-71-501

**Danger Areas
Figure 201**

R
R
001B

EFFECTIVITY: ALL

71-00-00
Page 205
Jun 15/95



MAINTENANCE MANUAL

- (a) In the event of compressor surge being encountered (identified by sudden increase in TGT or rumbling or banging sound) proceed as follows:
- (b) Reduce power immediately sufficient to clear surge, monitoring in particular TGT, which should decrease.
- (c) Allow engine to stabilize at idle and when wind conditions favorable, accelerate slowly, monitoring standard parameters, in particular TGT, to determine whether surge recurs.
- (d) If surge does not recur continue with engine test sequence and if apparent that surge occurred as a result of adverse wind conditions the Inspection Following Engine Surge (Ref. 71-00-00, Inspection/Check) need not be performed.
- (e) If surge recurs, reduce power immediately sufficient to clear surge, monitoring in particular TGT, which should decrease. Then stop engine after 5 minutes at idle and investigate cause, (Ref. 71-93-00).

R

R

R

R

R

- (4) Low Pressure (LP) Compressor Spinner - Static Electricity Discharge

During engine running in low humidity conditions, sparks may be observed around the LP compressor spinner. This is not detrimental to the engine.

- (5) If at any time during engine testing a fuel leak or vapor is seen coming from the Zone 2 vent in the Overboard Drains Mast, the engine should be shut down in accordance with normal procedures and the leak rectified.

D. Anti-icing

Engine inlet anti-icing should normally be used in the conditions defined below.

C

C

C

C

C

C

C

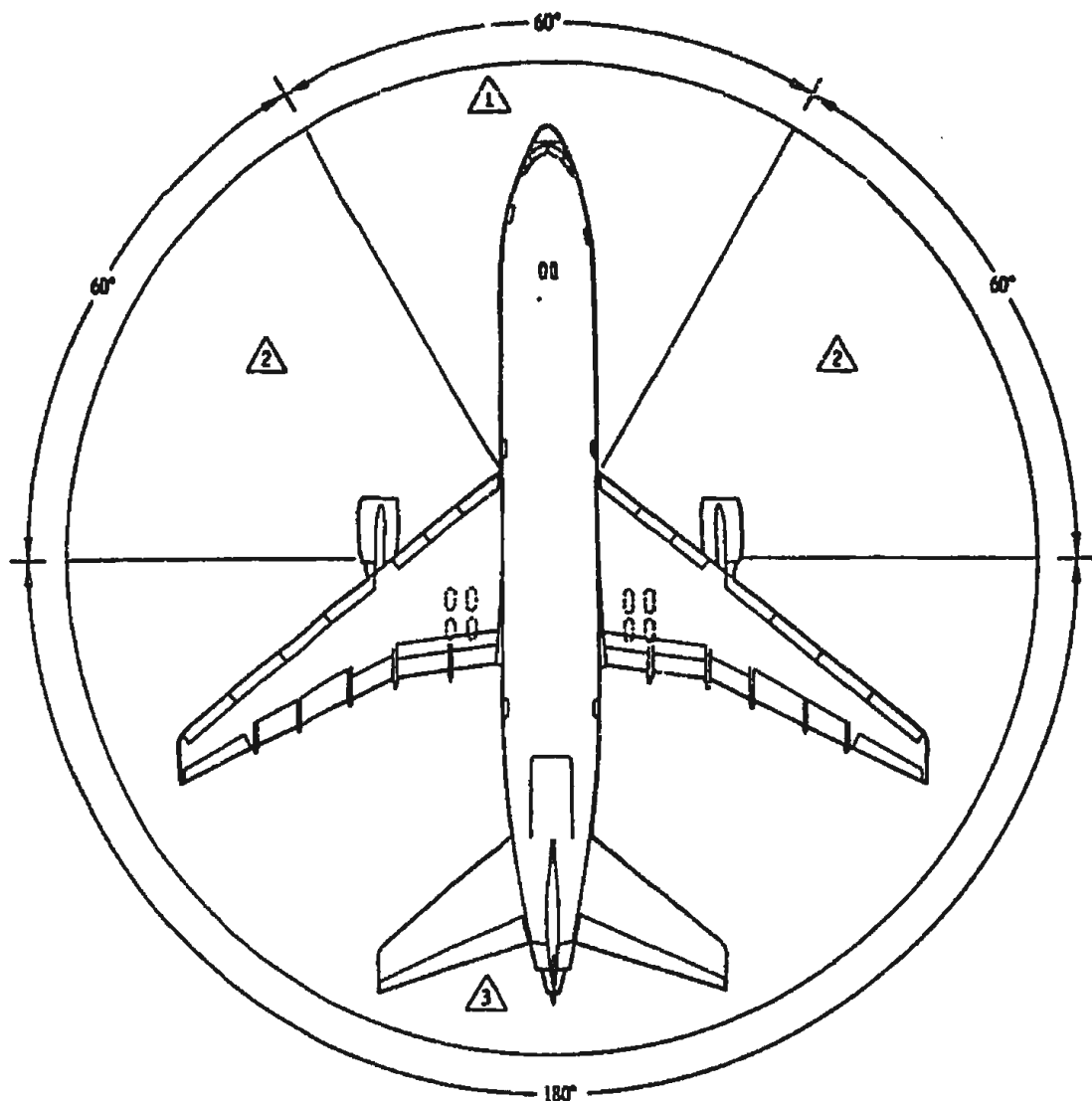
C

- (1) To prevent damage due to ice ingestion, engines must not be operated in icing conditions without Engine Anti-Ice selected ON. This encompasses any engine run-up including trim and performance checks. If a condition requires Anti-Ice OFF during run-up in an icing condition, Engineering must be contacted. Do not operate engines without Anti-Ice in icing or potential icing conditions.

EFFECTIVITY: ALL

001B

71-00-00
Page 206
Jun 15/95



NOTE

- 1 PREFERRED (NO LIMIT WIND VELOCITY).
- 2 MARGINALLY ACCEPTABLE (15 KNOTS MAX. WIND VELOCITY).
- 3 UNACCEPTABLE ABOVE FLIGHT IDLE IF WIND VELOCITY EXCEEDS 5 KNOTS.

- 4 IF DURING ENGINE RUNNING UNDER CROSS-WIND CONDITIONS, FLUCTUATING ENGINE PARAMETERS ARE NOTED (PRIMARY EPR) REDUCE POWER TO AVOID COMPRESSOR STALL. EITHER RE-POSITION AIRCRAFT INTO WIND OR OPERATE AT LOWER POWER.
- 5 APU CAN BE OPERATED DURING GROUND RUNS.

M1-0100-71-568

Preferred Relative Wind Direction During Engine Maintenance Runs
Figure 202

R EFFECTIVITY: ALL

001B

71-00-00
Page 207
Dec 15/92



- (2) Icing conditions are defined as temperatures less than 46°F and visible moisture. Visible moisture is defined as fog with visibility of 1 mile or less, rain or snow.
- (3) Engine icing can occur with outside air temperature (OAT) above freezing. The reduced pressure occurring as air is drawn into the engine causes an associated temperature drop which may be sufficient to cause the entrapped moisture to condense and freeze on the engine inlet components. If no Engine Anti-Ice is used, extended ground operations can generate substantial accumulations of inlet ice which may subsequently break loose and be ingested damaging the engine.
- (4) To prevent this, the following procedure will be effective anytime an engine is run by maintenance. Immediately after an engine has stabilized at idle, Engine Anti-Ice is to be selected ON if the OAT is 46°F (8°C) or less.
- (5) If engine performance tests are required which require Anti-Ice to be selected OFF (i.e., Part Power Trim or Acceleration Check) select Anti-Ice OFF, perform check, and reselect Anti-Ice ON. If icing conditions exist, do not operate engine with Anti-Ice OFF; contact MCIEE.

E. Engine Starts

(1) Satisfactory Starts

Defined as a start which provides a light-up within 30 seconds of selecting FUEL AND IGNITION switch to ON or ENRICH as required, and progressive acceleration to idle with TGT remaining within limits.

(2) Unsatisfactory Starts

(a) Hot Start

A start during which the TGT appears likely to exceed the limits for starting.

(b) Hung Start

Defined as a start during which the engine lights up satisfactorily but speed increases slowly or decays and TGT approaches the starting limit.

(c) Aborted Start



A start during which the starting cycle is discontinued, for any reason, before the start is completed.

F. RB211 Cold Weather Starting

- (1) The recent siege of cold weather has brought with it the usual difficulties of starting and operating RB211 engines which have cold soaked over a period of time. First and foremost, if at all possible an engine warm up should be accomplished on aircraft which have laid over six hours or more with ambient temperatures of 20 degrees Fahrenheit or less approximately two hours prior to departure time.
- (2) The warm up can be accomplished at idle power. When oil quantity starts to rise and oil temperature is above 10 degrees Celsius, pull ground idle C/B and allow engine to accelerate to inflight idle for 30 seconds. Push in C/B allowing engine to stabilize at idle and shut engine down. The following procedure may be used when starting cold soaked engines in ambient temperatures below -10 degrees Celsius. Using normal starting procedure select Enrich as N3 approaches 25 percent ensuring that N2 is at least 10 percent.

NOTE: When starting in extremely low ambient temperature conditions with a cold soaked engine, initial indication of light-up, as seen on the TGT indicator, can be very small. In these circumstances any rise in TGT should be considered indicative of a light-up and the start attempt should be continued. Allow 60 seconds for light-up before abandoning start when using this procedure.
- (3) When starting under cold soak, sub-zero temperature conditions, oil pressure rises to full scale (100 p.s.i.) reading. The filter blocked warning light may illuminate and indicated oil quantity may fall to zero. As oil temperature rises, with the engine at idle conditions, oil pressure will fall, filter blocked light will extinguish and oil quantity will return to normal. The engine should not be accelerated from idle until indicated oil quantity starts to rise and oil temperature is above minus 10 degrees Celsius. Be aware of oil quantity decreases as temperature increases. Oil quantity should return; however, this does not always happen. Do not reservice without determining where the oil went.



MAINTENANCE MANUAL

NOTE: AVM cold weather phenomenon. Under certain conditions when starting cold soaked, sub-zero temperature engines, AVM on both channels may be high, (2.5 plus units) with the AVM light on. This can be the result of congealed oil entering into the compressor drum. If a flight returns or this is experienced on first runup of the day, maintenance should reset AVM light and run engine at a power setting which will produce no more than 2.0 units of AVM. Warm engine and cycle thrust lever back and forth gradually increasing power until AVM is normal.

(4) If the engine does not light off, check for fuel out the exhaust. The absence of fuel generally indicates failure of the HP fuel shut off valve. Verify this by checking the indicator on the valve. If the engine does not light off with fuel out the exhaust, suspect ignition problems. A quick check of this system can be accomplished as follows:

(a) Pull respective HP fuel shut off valve circuit breaker.

(b) Remove both ignitors and test fire in the air. A rich blue spark should be observed on both ignitors or make corrections to the ignition system.

(5) A major problem is determining if the starting difficulty is caused by a lean or rich condition of the fuel system. A lean condition is one in which cold day enrich is required and the engine slowly accelerates to a point that the engine hangs and stops accelerating. Usually the TGT will climb slowly and stop, resulting in an aborted start due to the starter cycle limit being exceeded. This condition can be helped by adjustment of the start control unit (SCU) if below 51 percent N3. Enrichment of the fuel system can be obtained by adjustment of the SCU in a counter clockwise direction. Loosen the jam nut and adjust pin in one-fourth turn increments. Normal setting of the SCU is flush. Full rich is when the adjustment pin is between .070 and .074 above the jam nut or the thickness of a dime. If adjusted, notify MCIMD/MCIEE of final adjustment in case follow up action is required.

(6) During starting when a hung start at 50 or 52 percent N3 is experienced, replacement of the N3 indicator should be tried in case the SCU is cutting out early. Actually this is rare, with the real problem being an

R EFFECTIVITY: ALL

001B

71-00-00

Page 210
Jun 15/95



MAINTENANCE MANUAL

FFR which has drifted lean requiring replacement. While starting, if TGT out races N3 compressor speed, and between 40 or 51 percent an engine noise, (stall), with TGT sudden increase toward overtemp, and the engine spools down, the problem is usually due to a rich condition. Correction for a problem of this nature usually requires considerable time and manpower to troubleshoot and correct. When problems of this nature are experienced the following procedure has been used with varying degrees of success.

(7) RB211 Hot Start Procedure

The following procedure may be used if a hot start is encountered at 51 percent.

- (a) Discontinue start and proceed to start remaining engines.
- (b) Prior to starting problem engine, select one pack-on, left and right cross bleeds-on, APU bleed air S/O switch-off, HP bleed air-on.
- (c) Restart problem engine, cross bleed start.
- (d) At about 44 percent N3 simultaneously, push-ground release switch on problem engine and close isolation valves on other operating engines.
- (e) After engine reaches ground idle, re-establish normal pneumatic system operation.

NOTE: While the forgoing procedure may be used when necessary, it must not be construed to be routine. MCIMD must be notified any time it is used for follow up action if necessary.

5. Action in Event of Engine Fire

A. General

CAUTION: FOLLOWING DISCHARGE OF EITHER AIRCRAFT OR GROUND FIRE EXTINGUISHER SYSTEMS, THE PROPULSION SYSTEM MUST BE CLEANED AS DETAILED IN 71-00-00, CLEANING, PAINTING, AND PRESERVATION. CARBON DIOXIDE FIRE EXTINGUISHANT SHOULD BE USED IF POSSIBLE AS THIS IS A NON-CORROSIVE GAS. ALTERNATIVES SHOULD ONLY BE USED IF NO CARBON DIOXIDE IS AVAILABLE AS MOST ARE INJURIOUS TO METALS, PLASTICS, AND RUBBER.

R EFFECTIVITY: ALL

001B

71-00-00

Page 211
Jun 15/95



MAINTENANCE MANUAL

- (1) In the event of an engine fire, immediately stop the affected engine and perform fire drill as detailed in either Paragraph B or C (cowled or uncowled condition).
- (2) In the event of an internal fire or exhaust collector fire in a static engine, carry out procedures detailed in Paragraph 5D.

NOTE: If it is not possible to verify engine rotation, then it is to be assumed that the engine is static three minutes after selecting fuel off or starter air off.

- (3) In the event of excessive T.G.T. or exhaust collector fire during starting or shut-down, carry out procedures detailed in Paragraph 9G.
- (4) To facilitate fire fighting, any other engines running must be stopped.
- (5) Fire team positioning will possibly be governed by local regulations and conditions but they must always be clear of the danger areas (Ref. Fig. 201).

B. Propulsion System in Cowled Condition

- (1) If a fire warning is indicated during ground running with all propulsion system cowls closed, use the aircraft fire extinguisher system. If, when the aircraft system is exhausted, the fire is not extinguished use ground fire extinguisher equipment.
- (2) Upon observing fire warning, proceed as follows:
 - (a) Engine power control lever (throttle lever) - Close
 - (b) FUEL AND IGNITION switch - OFF
 - (c) FIRE PULL handle - Pull

NOTE: With the fire handle pulled, a fire detected in the associated engine accessory compartment area will not sound the fire bell or illuminate the master FIRE lights. The fire handle and glareshield master warning lights will illuminate as would the engine fire detector loop lights (A and B), and the FIRE DET LOOP indicator on the pilots annunciator panel.

R EFFECTIVITY: ALL

001B

71-00-00

Page 212
Jun 15/95



- (d) Extinguisher discharge switchlights - Select MAIN DISCH
- (e) Bottle MAIN DISCH light - Check on
If the fire warning persists longer than 30 seconds:
- (f) Extinguisher discharge switch - Select ALTN DISCH
- (g) Bottle ALTN DISCH light - Check on
- (h) Use ground fire extinguisher equipment as required.

C. Propulsion System in Uncowled Condition

- (1) If a fire warning is indicated during ground running with the propulsion system cowls open or removed, ground fire extinguisher equipment should be used in preference to aircraft equipment. The aircraft equipment being ineffective due to immediate dispersal.
- (2) Upon observing fire warning, proceed as follows:
 - (a) Throttle lever - Close
 - (b) FUEL AND IGNITION switch - OFF
 - (c) FIRE PULL handle - Pull

NOTE: With the fire handle pulled, a fire detected in the associated engine accessory compartment area will not sound the fire bell or illuminate the master FIRE lights. The fire handle and glareshield master warning lights will illuminate as would the engine fire detector loop lights (A and B), and the FIRE DET LOOP indicator on the pilots annunciator panel.

- (d) Ground fire extinguisher equipment should be used on order of person in charge of operation.

D. Internal Engine Fire Or Exhaust Collector Fire - Engine Static

For excessive T.G.T. or exhaust collector fire during starting or shutdown, refer to Paragraph 9.G.



If no starting air source is immediately available, use ground fire extinguishing equipment and do not attempt to dry motor engine.

- (1) Place appropriate FUEL AND IGNITION switch to OFF.
- (2) On aircraft without SB80-007,
on pilots overhead circuit breaker panel CB 1, Zone 210, open appropriate ENG ISLN VALVE circuit breaker (G10, G11, or G12).
- (2) On aircraft with SB80-007,
proceed to step (3).
- (3) Pull appropriate fire pull handle.

CAUTION: DISCHARGING FIRE BOTTLES WILL HAVE NO EFFECT. GROUND FIRE EXTINGUISHING EQUIPMENT SHOULD BE USED IF DRY MOTORING FAILS TO EXTINGUISH FIRE.

NOTE: With the fire handle pulled, a fire detected in the associated engine accessory compartment area will not sound the fire bell or illuminate the master FIRE lights. The fire handle and glareshield master warning lights will illuminate as would the engine fire detector loop lights (A and B), and the FIRE DET LOOP indicator on the pilots annunciator panel.

- (4) Engage GROUND START switchlight. Refer to Paragraph 7.A. for starter limitations.
- (5) If dry motoring fails to extinguish fire within 30 seconds, depress GND START RELEASE switchlight and use ground fire extinguishing equipment to extinguish fire.
- (6) Reject engine and inspect in accordance with special procedure 11 (Ref. Rolls-Royce Engine Manual 72-00-00).

6. Action in Event of Engine Turbine Cooling Air or Nacelle/Pylon Overheat Warning

A. Upon observing warning, proceed as follows:

- (1) Throttle lever - Close
- (2) FUEL AND IGNITION switch - OFF
- (3) Investigate warning.

R EFFECTIVITY: ALL
R
001B

71-00-00

Page 214
Jun 15/95

LOCKHEED
MAINTENANCE MANUAL

7. Starter Operating Limitations

A. The starter duty cycle may consist of the following:

C NOTE: When it is determined duty cycles are exceeded, check
C magnetic chip detector, drain oil and reserve oil.

(1) Aborted Start

Two attempts of three minutes each are permitted followed by a one minute attempt. No cool down between starts.

(2) Continuous Limit

A single continuous run of 5 minutes is permitted.

(3) Wash Cycle

RB211 Engine compressor washing will be permitted when required, as follows:

Wash

Two minutes on

Ten minutes off

Repeat wash

Rinse

Two minutes on

N3 to zero

Repeat rinse

Dry

Two minutes on

(4) A thirty minute cool down period is required after completing any of the three cycles above.

8. Ground Operating Limitations

A. Speed, Temperature and Duration

R EFFECTIVITY: ALL
R
001B

71-00-00
Page 215
Jun 15/95

LOCKHEED
MAINTENANCE MANUAL

CONDITION	N1%	N2%	N3%	MAX. TGT DEGREES C	TIME LIMIT
During starts	-	-	-	550	Momentary (Not exceeding 2 seconds)
Ground idle (NOTE 1)	21.0 to 23.3	-	-	460	Unrestricted
Max. continuous (Engines without RR SB72-5089)	101.0	101.5	93.7	700	Unrestricted
Max. continuous (Engines with RR SB72-5089)	101.0	101.5	94.2	710	Unrestricted
Max. for acceleration (NOTE 2)				738	2 minutes
Max. Take-off (NOTE 2)	99.5	102.5	95.0	728	5 minutes
C Max. reverse C (NOTE 3A)	101.3				30 seconds
Max. overspeed	103.0	106.0	96.2	-	20 seconds
Max. overtemperature				750	20 seconds

NOTES

1. The given ground idle N1 relates to an ambient temperature of 15 deg C. The N1 limit varies by 1.0 percent for each 30 deg C change of ambient temperature. N1 increases above 15 deg C and decreases below 15 deg C ambient temperature.
2. It is permissible to use 738 degrees C TGT for 2 minutes at takeoff power but the total time must not exceed 5 minutes.
3. When a limit is indicated to have been exceeded, consideration should always be given to the possibility of instrument error being involved. If it is believed this may be the problem or if the limit was exceeded only slightly, check the instrument system(s) involved for accuracy. This

R EFFECTIVITY: ALL

001B

71-00-00
Page 216
Jun 15/95

LOCKHEED
MAINTENANCE MANUAL

- . C must be done with approved test equipment. A shop check
C will sometimes be necessary.
- C The applicable error value from the accuracy check is to be
C applied to the over-limit indication to determine the
C corrected reading. This will show whether the limit has or
C has not been exceeded.
- C 3A. All FFR thrust lever stops are set for 90.0% N1 max in Rev.
C If limit exceeded, no inspection is required. Determine and
C correct cause of overspeed.

100 percent N1 = 3900 LP rpm
100 percent N2 = 7000 IP rpm
100 percent N3 = 10611 HP rpm

B. Lubrication System

- (1) Oil pressure (at all rpm between ground idle and takeoff within approved oil temperature limits).

Minimum acceptance:

Ground idle to 70 percent N3 - 35 psi

Above 70 percent N3 - 40 psi

NOTE: Large reductions in engine rpm to below 70 percent N3 may result in transient reductions in oil pressure to below 35 psi. This is acceptable provided the oil pressure does not fall below 18 psi and recovers to at least 35 psi within 5 minutes of throttling back.

- (2) Oil Temperature

Minimum for starting - minus 40 deg C

Minimum before advancing throttle lever - minus 10 deg C

Maximum:

Unrestricted - plus 100 deg C

R EFFECTIVITY: ALL
R
001B

71-00-00
Page 217
Jun 15/95



MAINTENANCE MANUAL

During transient overshoots on reducing RPM (15 minute limit) - plus 135 deg C

(3) Oil Consumption

Maximum consumption in flight - 1.2 US qt/hr., 1 Imp. qt/hr., 1.14 liter/hr.

NOTE: Consumption may be determined by computing average consumption during not less than 5 or no more than 25 hrs. of flight.

NOTE: Consumption in excess of 2 qt/hr. over any flight leg will require investigation.

NOTE: When an engine is confirmed to be exhibiting oil consumption in excess of Maintenance Manual limits, which cannot be corrected on-wing, continued operation is permissible with Engineering concurrence, provided there is sufficient usable oil for the intended sector until correction to the problem is achieved on or off wing.

NOTE: Use these limits in conjunction with 71-00-00 Adjustment and Test Paragraph 1.F. Notes for high oil consumption or oil replenishment high.

Isolate and correct oil leakage. Reference Oil Consumption Troubleshooting - M11-72-54 and 79-00-00, Troubleshooting Section.

C. Fuel System

(1) Fuel Temperature

(a) Maximum at inlet to engine LP pump - plus 57 deg C.

(b) Maximum at inlet to HP pump (measured at fuel filter outlet):

Unrestricted - plus 95 deg C

During transient overshoots on reducing RPM (15 minute limit) - plus 115 deg C

(2) Fuel Drainage

Drainage period (from closing the HP shutoff valve after an aborted start or wet motoring cycle) - Minimum 30 seconds

EFFECTIVITY: ALL

001B

71-00-00
Page 218
Dec 15/95

LOCKHEED
MAINTENANCE MANUAL

D. Vibration Limits

Maximum deflection (from either pick-up, any frequency) - 2.5 units (=1 in/sec)

Maximum level change - 1.0 unit (=0.4 in/sec).

E. Minimum Bleed Air System Pressure for Starting (psig)

ALTITUDE FEET	AMBIENT TEMPERATURE DEG C					
	-50	-30	-10	+15	+40	+55
Sea level	34	33	30	27	24	20
4,000		29	26	23	20	
8,000		24	22	19	17	

NOTE: The above limits are based on use of the on-board APU, engine cross-bleed or other hot air sources. The pressure for ambient temperature ground air supply should be 44 (±2) psig. Start time may be prolonged due to hydraulic pump and IDG loading.

F. Action to be taken if limitations are exceeded

(1) Temperature

- (a) For overtemperature inspection requirements (starting and relighting) refer to Fig. 203.
- (b) For overtemperature inspection requirements (except starting) refer to Fig. 204.

NOTE: M99-72-03 overtemperature report must be utilized with each overtemperature event.

(2) N1 Overspeed

- (a) For N1 overspeed incidents exceeding operating limitations, reject engine for strip examination.

(3) N2 overspeed

- (a) For N2 overspeed inspection requirements refer to Figure 205.

G. Hydraulic pump operation during engine start

R EFFECTIVITY: ALL

001B

71-00-00
Page 219
Jun 15/95



- (1) Insure that the engine-driven PUMP S/O switches are in, flowbars illuminated, and off lights extinguished.
- (2) Prior to starting engine No. 2, turn on both AC electric motor pumps to pressurize hydraulic systems B and C. Leave AC motor pumps on until after engine start and engine pumps are supplying pressure.
- (3) Prior to starting engine No. 1, turn on the B-A PTU (and B-3 pump if No. 2 engine is not running) to pressurize hydraulic system A. After engine is started and the engine-driven pump is supplying pressure, turn off the B-A PTU and B-3 pump.
- (4) Prior to starting No. 3 engine, turn on the C-D PTU (and C-3 pump if No. 2 engine is not running) to pressurize hydraulic system D. After engine is started and the engine-driven pump is supplying pressure, turn off the C-D PTU and C-3 pump.

9. Starting the Engine

The starting procedure must include the following items though not necessarily in the sequence given.

Engines can be started using the auxiliary power unit (APU), a ground air supply or cross-bleed air from a running engine. Verify that adequate air pressure is available (Refer to chart in Paragraph 8E).

A. Before Starting

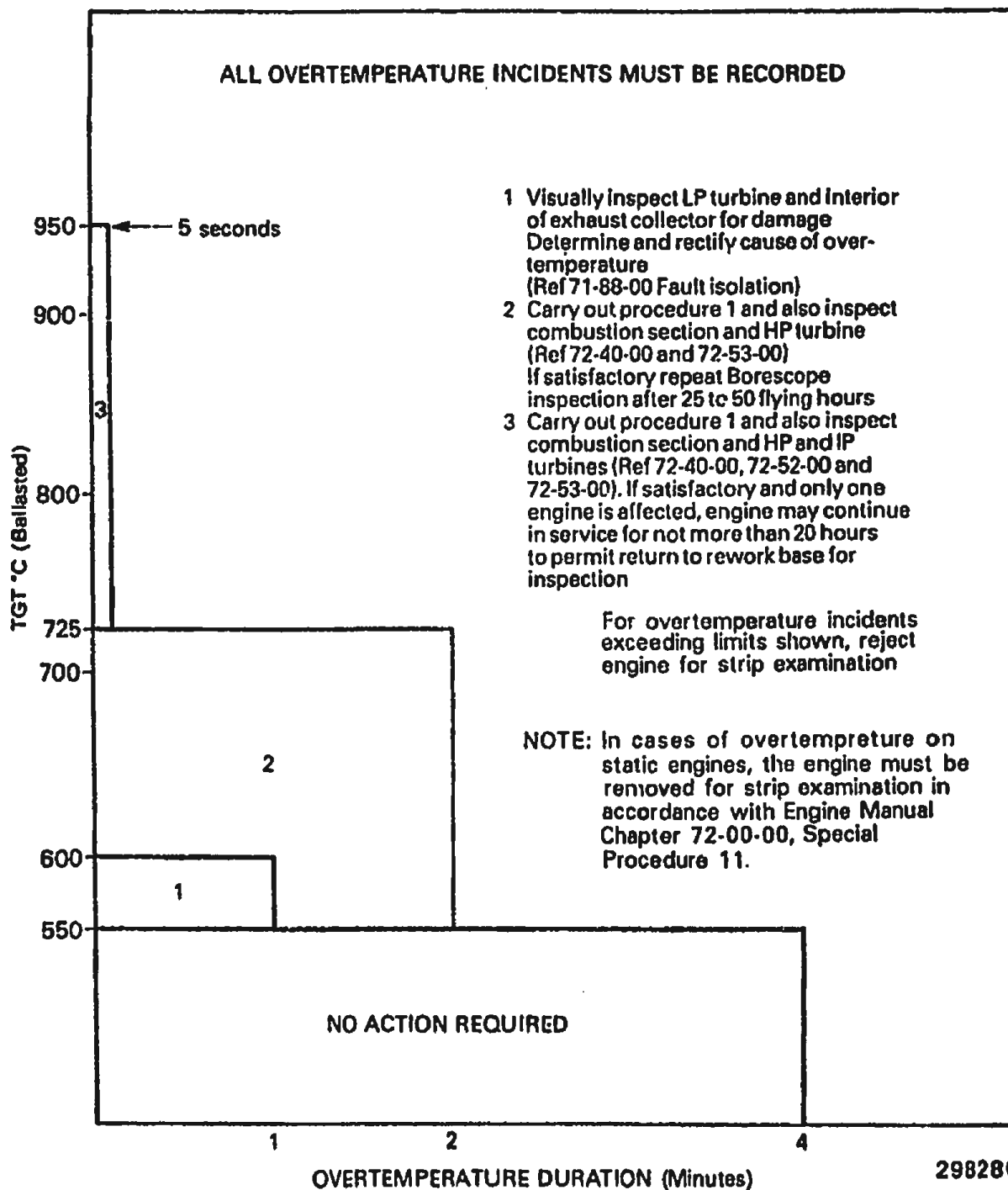
- (1) GROUND START and FLIGHT START switchlights - Released (out)
- (2) Electrical power - ON (check bus voltage)
- (3) Fire detection systems - Test
- (4) Engine overheat indicating systems - Test
- (5) Throttle levers - Idle
- (6) Reverse thrust levers - Fully forward and down
- (7) CONTINUOUS IGNITION switchlight - Released
- (8) FUEL AND IGNITION switches - OFF
- (9) ANTI-ICE switchlights - Released

R EFFECTIVITY: ALL

001B

71-00-00
Page 220
Jun 15/95

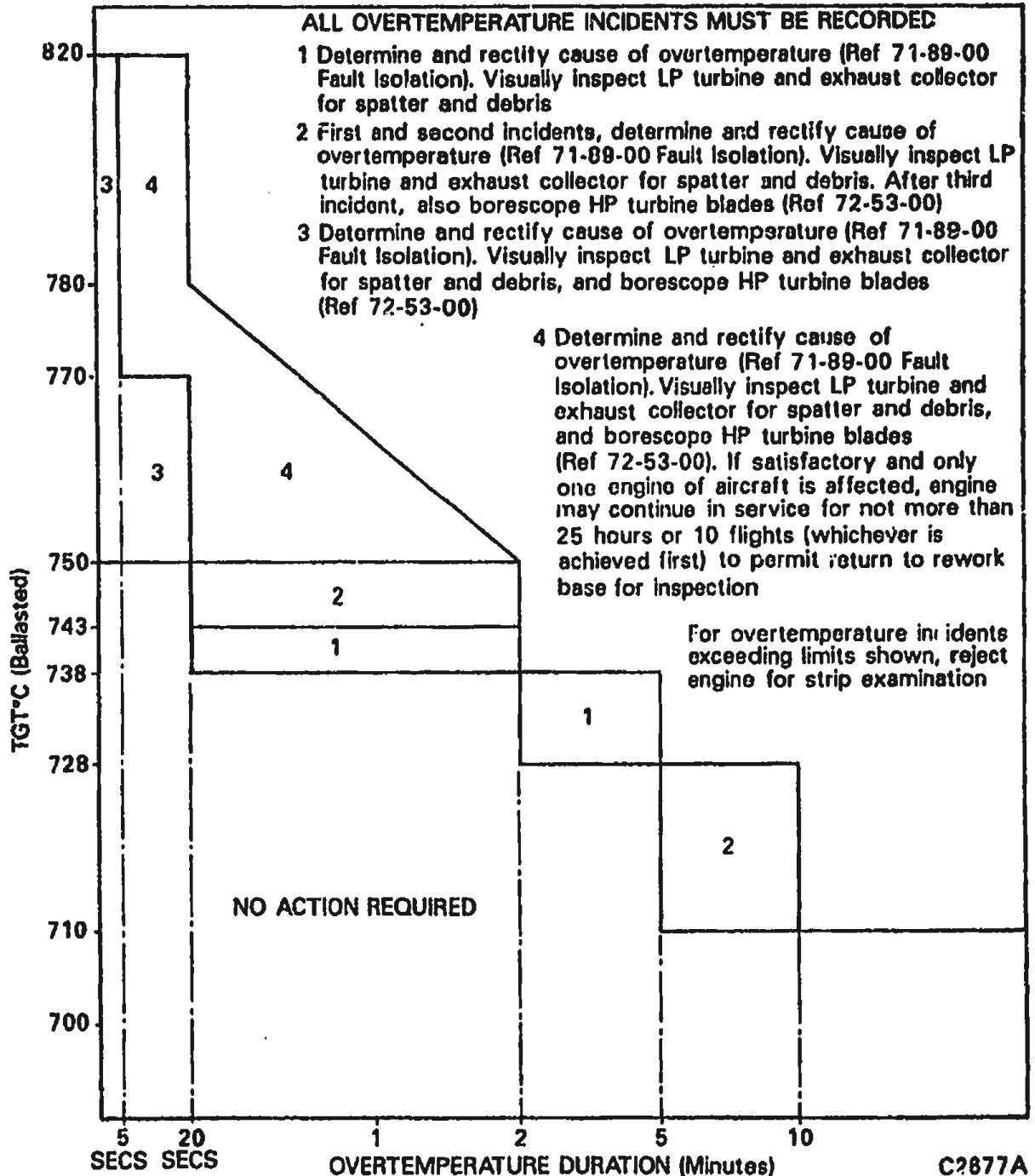
LOCKHEED
MAINTENANCE MANUAL



**Overtemperature Inspection Requirements
(Starting, Relighting and Sub Idle Running (Not Static))
Figure 203**

R EFFECTIVITY: WITH AND WITHOUT SB72-5089
R
001B

71-00-00
Page 221
Jun 15/95

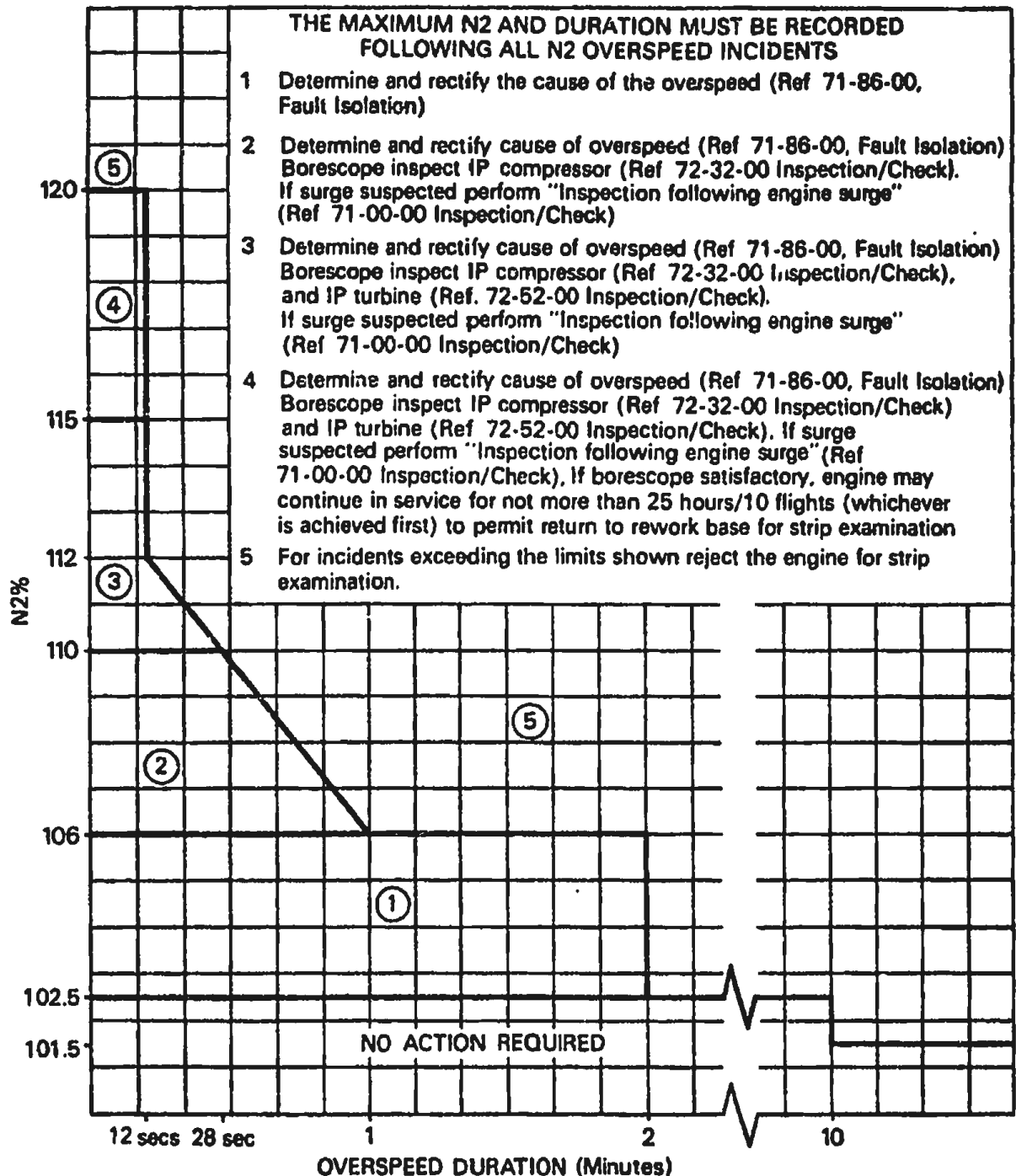


Overtemperature Inspection Requirements
Engines Running at Ground Idle and Above
Figure 204

C2877A
M1-0001-71-806

R EFFECTIVITY: WITH SB72-5089
R
001B

71-00-00
Page 222
Jun 15/95



685298
M1-0007-71-558

N2 Overspeed Inspection Requirements
Figure 205

EFFECTIVITY: ALL

71-00-00
Page 223
Jun 15/95

R
R
001B



- (10) Hydraulic PUMP S/O switchlight - As required
- (11) Engine instruments - Check
- (12) Vibration indicators - Test
- (13) Warning lights - Test
- (14) OIL PRESS. indicator lights - Check on
- (15) Oil quantity for each engine - Check
- (16) Oil temperature - Above minimum for starting
- (17) Fuel control amplifier switches - Normal
- (18) ENG. TANK VALVES - Open
- (19) FIRE PULL handle - In (indicator lights out)
- (20) FUEL PRESSURE indicating - On

CAUTION: DO NOT OPERATE BOOST PUMP WITH LESS THAN 1200 POUNDS/545 KILOGRAMS OF FUEL IN TANK UNLESS THE BOOST PUMP HAS BEEN INSPECTED [REF. 28-24-02, PARA. 4B(4)].

IF BOOST PUMP CIRCUIT BREAKER TRIPS, DO NOT RESET UNTIL IT IS VERIFIED, BY INSPECTION, THAT PUMP AND HOUSING CONNECTORS ARE NOT RESPONSIBLE.

- (21) One fuel booster pump - ON in tank supplying the engine to be started (warning lights out).
- (22) ENG HI PRESS bleed air shutoff valve switchlights - Released (OUT) to eliminate possible air loss through valves

B. Starting Air Source

Engines can be started using the auxiliary power unit (APU), a ground air supply or cross-bleed air from an operating engine. The ENG ISLN VALVE, CROSSBLEED, and aft fuselage ISLN VALVE switchlights on FE/SO panel must be depressed (OFF indication out) for the applicable engine and air source (Ref. 36-00-00). Provide air source as follows:

- (1) APU Air
 - (a) Start APU (Ref. 49-00-01).



MAINTENANCE MANUAL

NOTE: When using the APU for starting, minimize the APU generator load (for each 10KW reduction in APU generator load the available starter torque for the engine being started increases approximately four percent).

(2) External Air

- (a) Connect ground air supply (Ref. 36-00-00).

(3) Crossbleed Air

- (a) Close APU bleed air shutoff valve.
- (b) Open HP air valve on operating engine(s).
- (c) Open pneumatic crossbleed valves as required.
- (d) Depress start switch when start valve opens then advance engine power control lever on operating engines to maintain required duct pressure (Ref. Para. 8E).

C. Starting

NOTE: If residual temperature is above 100 degrees C, delay placing the FUEL AND IGNITION switch to ON until TGT is below 100 degrees C; do not select ENRICH unless the engine fails to accelerate satisfactorily after lightoff.

If engine fails to light up within 30 seconds from selecting FUEL AND IGNITION switch to ON or ENRICH, select FUEL AND IGNITION switch OFF, continue to motor the engine for a further 30 seconds then reselect FUEL AND IGNITION switch ON.

If engine still fails to light up within 30 seconds, abort the start and check for free flow of fuel from turbine assembly drain outlet in turbine lower fairing. If fuel flow is restricted, investigate the cause.

ENRICH may be used at operators discretion. However, if, when using ENRICH, TGT rise overtakes N3 rise (e.g. if 350 deg C is reached before 35% N3) or the rate of increase of TGT indicates that the limit will be exceeded, abort the start. If bleed air system pressure is satisfactory effect a further start. If start again has to be aborted, investigate the cause.

R EFFECTIVITY: ALL

0018

71-00-00

Page 225
Jun 15/95



MAINTENANCE MANUAL

If during starting, the rate of increase of TGT indicates that the TGT limit will be exceeded, abort start. If any start has to be aborted due to excessive TGT, the subsequent start should be attempted without the use of ENRICH.

If during a start with the FUEL AND IGNITION switch selected to ON, the TGT and N3 are slow to increase, the FUEL AND IGNITION switch may be selected to ENRICH to improve response. ENRICH may be selected at any point, and may be released at any point except between 35% and 46% N3 (VALVE OPEN light out).

If VALVE OPEN and GND START RELEASE lights remain ON after approximately 51% N3, push the GND START RELEASE switchlight and check that lights go out. Investigate the cause and rectify when convenient.

If VALVE OPEN light remains ON after reaching ground idle rpm with the GND START RELEASE light out, select starter air supply off, FUEL AND IGNITION switch OFF and investigate the cause.

- (1) Residual TGT - Not above 100 deg C
- (2) CONTINUOUS IGNITION switchlight - Released (out)
- (3) HI PRESS bleed air shutoff valve switchlights - Released (OUT)
- (4) GROUND START switchlight - Depress (VALVE OPEN light on GND START RELEASE switchlight PUSH light on); if engine rotation is not observed within 10 seconds, push GND START RELEASE switchlight.

NOTE: For a given duct pressure, the wing engines spool-up faster than the center engine and therefore if possible, a wing engine should be started first in high altitude and/or high temperature conditions.

- (5) Bleed air system - Ensure minimum requirement (Ref. Para. 8E)
- (6) GND START RELEASE switchlight - On
- (7) FUEL AND IGNITION switch - Select on as N3 approaches 25 percent ensuring that N2 is at least 10 percent. ENRICH may be used after light up.

R EFFECTIVITY: ALL

R
001B

71-00-00

Page 226
Dec 15/95



- (8) Check N1 indicating by 30 percent N3 and oil pressure indicating within 30 seconds of initial engine rotation, otherwise abort the start (Ref. Para. E).
- (9) Oil PRESSURE warning light - Out at 15 to 25 psi
- (10) VALVE OPEN light - Out at 43 percent to 46 percent N3
- (11) GROUND START switchlight - Released at approximately 51 percent N3
- (12) GND START RELEASE switchlight - Out at approximately 51 percent N3
- (13) FUEL AND IGNITION switch - If ENRICH is used, release to ON at any time except between 35% to 46% N3.

D. Check at Stabilized Ground Idle

- (1) Oil Pressure - Check within limits (Ref. Para. 8B)
- (2) N1 - Check within limits (Ref. Para. 8A)
- (3) TGT - Check within limits (Ref. Para. 8A)
- (4) FUEL PRESSURE indicator - Out
- (5) Vibration - Check within limits (Ref. Para. 8D)
- (6) Bleed air system switchlights and valves - As required

WARNING: SHUT DOWN ENGINE AND REPLACE PUMP IF THE ENGINE DRIVEN HYDRAULIC PUMP FAILS TO PRIME (LO PR light out) WITHIN TWO MINUTES AFTER COMPLETION OF ENGINE START CYCLE.

- (7) Hydraulic PUMP S/O switchlight - Depressed, flow bar(s) illuminated, OFF lights extinguished
- (8) After all engines are started, CONTINUOUS IGNITION - Released, if selected
- (9) Run at ground idle power for at least 5 minutes before increasing power.

NOTE: If takeoff power is to be used, warm up engines at 60 percent N1 for one minute or flight idle for ten minutes.

E. Hot Start

R
R
001B EFFECTIVITY: ALL



- (1) If a start is discontinued for high TGT, before starter cut out, the next start will be performed as follows:
 - (a) If a high tailwind component exists, (20 knots above -10°C , 10 knots below -10°C) it is desirable to reposition aircraft into wind.
 - (b) Use engine crossbleed to start; advance throttle of operating engine(s) (after aircraft brakes are set) to provide optimum pneumatic duct pressure.
 - (c) Prior to selecting FUEL & IGNITION ON, motor engine to obtain maximum N3 rpm and assure positive fan rotation (N1).
 - (d) If residual TGT is above 90°C , continue to motor engine until TGT drops below 90°C .
 - (e) Use ENRICH if required in accordance with normal starting procedures.
- (2) If a start is discontinued for high TGT, after starter cutout, the next start will be performed using the following alternate start procedure:
 - (a) Start other engine(s).
 - (b) Select any one pack - ON.
 - (c) Left and Right CROSSBLEED VALVES - OPEN.
 - (d) Use ENRICH if required in accordance with normal starting procedures.
 - (e) HPBLEED valve on engine being started - selected OPEN.
 - (f) Restart subject engine, using normal crossbleed start procedure, minimum 30 psi duct pressure.
 - (g) At 44% N3, simultaneously:
 - Ground Start Release - PUSH
 - Operating engine(s) Isolation Valve(s) - OFF.
 - (h) Allow engine to accelerate to Ground Idle.
 - (i) Re-establish normal pneumatic system operation.

F. Abort Start

R EFFECTIVITY: ALL

001B



MAINTENANCE MANUAL

CAUTION: TO MINIMIZE THE POSSIBILITY OF STARTER CRASH RE-ENGAGEMENT DURING AN ABANDONED START ABOVE 35% N3, THE GROUND START RELEASE SWITCH MUST BE PUSHED IMMEDIATELY AFTER SELECTING FUEL AND IGNITION OFF. IN THE EVENT A CRASH RE-ENGAGEMENT IS REPORTED OR SUSPECTED, A CHECK OF THE HIGH SPEED GEAR BOX MAGNETIC CHIP DETECTOR IS REQUIRED.

- (1) FUEL AND IGNITION switch - OFF
and immediately
GND START RELEASE
switchlight - Push (hold for 2 seconds).

G. Excessive TGT/Exhaust Collector Fire

If during starting or shut-down, excessive TGT is encountered or an exhaust collector fire is identified carry out the appropriate following procedure:

- (1) During starting, before starter cut out (valve - OPEN, light - ON).
- (a) FUEL AND IGNITION switch - OFF.
- (b) Continue motoring engine to reduce TGT or extinguish exhaust collector fire. Refer to Para. 7.A. for starter limitations.

If TGT is not reduced or exhaust collector fire continues after dry motoring the engine, a malfunction of the H.P. fuel shut-off valve must be assumed and the following procedure carried out.

- (c) On aircraft without SB80-007, open appropriate ENGINE BLEED VALVE - ENG ISLN VALVES circuit breaker (G10, G11 or G12) on pilots overhead circuit breaker panel CB1 zone 210.
- (c) On aircraft with SB80-007, proceed to step (d).
- (d) FIRE PULL HANDLE - Pull appropriate handle.

NOTE: Discharging fire bottles will have no effect.

With the fire handle pulled, a fire detected in the associated engine accessory

R EFFECTIVITY: ALL

001B

71-00-00
Page 229
Jun 15/95

LOCKHEED



MAINTENANCE MANUAL

compartment area will not sound the fire bell or illuminate the master FIRE lights. The fire handle and glareshield master warning lights will illuminate as would the engine fire detector loop lights (A and B), and the FIRE DET LOOP indicator on the pilots annunciator panel.

- (e) Continue motoring engine to reduce TGT or extinguish exhaust collector fire.

NOTE: When excessive TGT is reduced or exhaust collector fire is extinguished check whether starter running limitations have been exceeded (Ref. Para. 7.A.) and rectify as necessary.

- (2) During starting, after starter cut out (valve - OPEN, GND. START RELEASE LIGHT - OUT)

or

During engine shut down.

- (a) FUEL AND IGNITION Switch - OFF.

- (b) Dry motor engine to reduce TGT or extinguish exhaust collector fire. Refer to Para. 7.A. for starter limitations.

CAUTION: N3 MUST NORMALLY BE ALLOWED TO RUN DOWN TO ZERO % BEFORE STARTER IS RE-ENGAGED. IN AN EMERGENCY TO REDUCE HIGH TGT OR EXTINGUISH FIRE, THE STARTER MAY BE RE-ENGAGED UP TO 30% N3 TO EFFECT DRY MOTORING. IF STARTER IS RE-ENGAGED FROM STATIC CONDITION, ABOVE 30% N3 PROCEED AS FOLLOWS:

(i) The HS gearbox magnetic chip detector, master chip detector, main oil pressure filter and fine scavenge filter must be inspected (Ref. 72-01-00, Inspection/Check) for metal deposits.

(ii) If metal deposits found are indicative of internal failure the external gearbox must be removed.

(iii) If metal deposits found are not indicative of internal failure or no deposits found the gearbox may continue in service provided that the chip detectors and filters

R EFFECTIVITY: ALL

R

001B

71-00-00

Page 230
Jun 15/95



MAINTENANCE MANUAL

are reinspected after next 25 hours of operation.

- (c) If the TGT is not reduced or exhaust collector fire continues after dry motoring the engine, a malfunction of the HP fuel shut-off valve must be assumed and the following procedure carried out.

(i) On aircraft without SB80-007, open appropriate ENGINE BLEED VALVE - ENG ISLN VALVES circuit breaker (G10, G11 or G12) on pilots overhead circuit breaker panel CB1 zone 210.

(i) On aircraft with SB80-007, proceed to step (ii)

(ii) FIRE PULL HANDLE - Pull appropriate handle.

NOTE: Discharging fire bottles will have no effect.

With the fire handle pulled, a fire detected in the associated engine accessory compartment area will not sound the fire bell or illuminate the master FIRE lights. The fire handle and glareshield master warning lights will illuminate as would the engine fire detector loop lights (A and B), and the FIRE DET LOOP indicator on the pilots annunciator panel.

(iii) Continue motoring engine to reduce TGT or extinguish exhaust collector fire.

NOTE: When excessive TGT is reduced or exhaust collector fire is extinguished check whether starter running limitations have been exceeded (Ref. para. 7.A.) and rectify as necessary.

H. Special Engine Starting Procedure using Aircraft Battery and External Air Source Only.

- (1) Establish ground communication through the service interphone jack in the nose wheel well.
- (2) Check all circuit breakers -- normal.
- (3) Battery switch -- ON.

R EFFECTIVITY: ALL

R
001B

71-00-00
Page 231
Jun 15/95



- (4) Standby power switch -- ON. Check to see the inverter is operating.
- (5) Pack flow control valves -- Released (OUT).
- (6) Connect external air sources to L.H. and center connections.
- (7) LH cross bleed valve -- Depressed (ON).
- (8) RH cross bleed valve -- Released.
- (9) Fuselage isolation valve -- Released.

- R (10) Engine 1, 2, and 3 HI PRESS valve switchlight -- Released.
- R (11) Engine 2 isolation valve -- Released.
- R (12) Engine 3 isolation valve -- Released.
- R (13) Engine 1 isolation valve -- Depressed.
- R (14) Apply pressure. Check that no air flows through packs.
- R (15) Commence normal start sequence on number 1 engine.
- R (16) Manually open start valve using either a wrench on the butterfly shaft hex flats or by pressing and holding the solenoid override button.

NOTE: The cowling must be opened before solenoid override button can be pressed.

CAUTION: DO NOT STAND IN PLANE OF STARTER TURBINE WHEEL. SERIOUS INJURY COULD OCCUR IN EVENT OF STARTER OVERSPEED.

- (17) 1 ground start switch -- Depressed.
- (18) Engine 1 FUEL AND IGNITION switch -- ON or ENRICH as appropriate at 20 percent N3 RPM.
- (19) Engine 1 start valve -- wrench closed or release solenoid override button at 43 percent N3 RPM.

NOTE: As with windmilling engine airstart, only TGT and N3 RPM instruments function until IDG comes on line. with windmilling engine airstart, only TGT and N3 RPM instruments function until IDG comes on line. Check engine oil pressure N1 RPM and N2 RPM as soon as IDG comes on line.

EFFECTIVITY: ALL

001B

71-00-00

Page 232
Dec 15/95



- (20) Standby power switch -- "OFF" after engine IDG on aircraft buses.

10. Motoring (Cranking) the Engine

A. Dry Motoring Cycle

- (1) Select FUEL AND IGNITION switch OFF and tag switch.
- (2) On pilots overhead circuit breaker panel CB1, zone 210, open and tag applicable engine circuit breakers B START IGN (F13, F14 or F15), and FUEL SHUTOFF (F16, F17, or F18).

On Flight Engineer/Second Officers aft circuit breaker panel CB3, zone 215, open and tag applicable engine circuit breakers START IGN SYS A (N6, N12 or N18), CONT IGN SYS A (R8), and CONT IGN SYS B (R9).

- (3) Open LH hinged cowl 413A or 423A for engines No. 1 or No. 3 (Ref. 71-11-00) or 433AL for engine No. 2 (Ref. 71-12-01); verify that HP fuel shutoff valve is closed, then close LH hinged cowl.
- (4) The procedure for dry motoring the engine is similar to the normal start procedure (Ref. Para. 9) except that the FUEL AND IGNITION switch is left in the OFF position. The GROUND START RELEASE switchlight must be depressed to terminate the motoring period.
- (5) When dry motoring is completed, close circuit breakers opened in Step (2) and remove all tags.

B. Wet Motoring Cycle

- (1) On pilots overhead circuit breaker panel CB1, zone 210, open and tag applicable engine circuit breaker B START IGN (F13, F14, or F15).

On Flight Engineer/Second Officers aft circuit breaker panel CB3, zone 215, open and tag applicable engine circuit breakers START IGN SYS A (N6, N12, or N18), CONT IGN SYS A (R8), and CONT IGN SYS B (R9).

- (2) The procedure for wet motoring is the same as a normal ground start (Ref. Para. 9). The GROUND START RELEASE switchlight must be depressed to terminate the motoring period.
- (3) When wet motoring is completed, close circuit breakers opened in Step (1) and remove all tags.

R EFFECTIVITY: ALL

001B

71-00-00

Page 233
Jun 15/95

LOCKHEED
MAINTENANCE MANUAL

11. Stopping the Engine

A. Rundown Time

(1) Ground idle to 5 percent of appropriate shaft speed:

N1 15 seconds minimum

N2 30 seconds minimum

N3 45 seconds minimum

B. Normal Stopping

If during ground running the engine has been run at power settings above ground idle, run the engine for 5 minutes at ground idle to facilitate uniform cooling of the engine before using the following procedure.

(1) Throttle Lever - Close

(2) FUEL AND IGNITION switch - OFF and check rundown times

(3) Flight station checks - As required

C. Stopping the Engine with failed HP Shutoff Valve

If after carrying out stopped procedure in Paragraphs 11A and B the TGT and fuel flow does not decrease, failure of the HP fuel shutoff valve can be assumed and the following procedure is to be carried out:

(1) Verify engine power control levers are in closed position.

(2) Verify fuel and ignition switches are off.

WARNING: WHEN FIRE HANDLE IS PULLED THE FIRE EXTINGUISHER BOTTLES ARE ARMED AND THE FIRE EXTINGUISHER DISCHARGE SWITCH EXPOSED, THIS MUST NOT BE ACTUATED.

(3) Pull the applicable fire handle.

If TGT exceeds 600 degrees C or exhaust collector fire occurs during engine shutdown refer to Paragraph 9.G.

NOTE: There may be a delay in excess of one minute at ground idle before the engine starts to run down, followed by a longer than normal run down; no further adjustments should be made to any controls.



With the fire handle pulled, a fire detected in the associated engine accessory compartment area will not sound the fire bell or illuminate the master FIRE lights. The fire handle and glareshield master warning lights will illuminate as would the engine fire detector loop lights (A and B), and the FIRE DET LOOP indicator on the pilots annunciator panel.

D. Emergency Stopping

The emergency stopping procedure should only be used when abnormal conditions arise, to prevent damage to the engine. It is recommended that immediately after the HP shaft stops rotating, the engine be dry motored (Ref. Para. 10A) for 30 seconds, except when internal damage is suspected. The motoring cycle should be repeated, if necessary, to reduce the indicated TGT to 100 deg C.

- (1) FUEL AND IGNITION switch - OFF
- (2) Flight station checks - As required

12. Prepare Engines for 2 Engine Ferry Flight

A. For Operational Engines:

- (1) Check magnetic chip detectors, fine scavenge oil filter and pressure oil filter.
- (2) Borescope H.P. turbine blades and H.P. compressor blades (Ref. 72-00-00, Inspection/Check).
- (3) Check oil quantity (Ref. 12-12-01, Servicing), Service IDG (Ref. 12-12-21, Servicing), Service Starter (Ref. 80-11-07, Servicing).

NOTE: Ensure oil tank cap is properly secured after servicing.

- (4) Change the hydraulic filters for the engine pumps on the system to be operated during the ferry and bleed systems of all air before departure.
- (5) Check visible ducts and tubes for possible leakage.
- (6) Visually check engine intake for foreign object damage (not previously blended out).
- (7) Visually check exhaust areas for damage.

R EFFECTIVITY: ALL

001B

71-00-00

Page 235
Jun 15/95



MAINTENANCE MANUAL

- (8) Replace igniter plugs (Ref. 74-21-02, Removal/Installation).

NOTE: An audible check of the ignition system may be accomplished as an alternative to replacing the igniter plugs (Ref. 74-00-00, Adjustment/Test).

- B. Preparation for Inoperative Engine (Ref. 71-00-04, Maintenance Practices).

C 13. Ground Idle Adjustment

- C A. Two major operational problems--spindowns and tailpipe fires
C have prompted changes in the acceleration and deceleration
C schedules of the fuel flow regulator.
- C B. The revised schedules have introduced a problem that has
C been seen in the past but practically corrected by the
C accepting of higher ground idles. The problem is DCU
C interference, which manifests itself in high ground idles
C and the inability to adjust ground idle with the idle
C adjustment on the FFR. Sometimes it appears as no flight
C idle operation, or the unit is stuck in flight idle.
- C C. Just a bit of explanation as to how this comes about. The
C engine receives fuel from basically three sources.
- C (1) The ACU (Acceleration Control Unit) schedule of the
C FFR.
- C (2) The DCU (Deceleration Control Unit) schedule of the
C FFR.
- C (3) The enrichment flow schedule of the start control unit.
- C These three sources of fuel are all supplying fuel to
C sustain the engine at idle.
- C D. Now the engine has a "steady running line" or a "demand
C line" that varies slightly with each engine, which
C establishes the amount of fuel required to idle the engine
C at 23% N1 or 61-63% N3. This demand line is normally
C between the acceleration line and deceleration line; but if
C the DCU schedule provides more fuel than the engine requires
C for idle, adjusting the idle will not get the idle down to
C the desired RPM.

C NOTE: Don't give up and don't change the FFR.

- C E. Apply an air load of two air conditioning packs. The
C introduction of the packs will bleed a sufficient amount of

R EFFECTIVITY: ALL

R
001B

71-00-00
Page 236
Jun 15/95



MAINTENANCE MANUAL

air from the compressor, raise the demand line, and lower the idle RPM. At this point, the idle adjustment will be effected, and the desired idle N1 and N3 RPM's will be obtainable.

F. Will the flight crew have a high idle problem? No. Normal operation of the aircraft requires the use of bleed air; and with bleed air being drawn from the engine, a normal idle will be seen. If additional air loads are applied, the engine will not spin down because additional fuel will be supplied by the acceleration schedule.

G. The start control unit or start fuel flow regulator, supplies slightly more fuel at idle than the start control unit used by other operators. Start control units are now being recalibrated to the reduced flow, and this slight reduction in starting fuel will aid in the setting of ground idle.

H. Keep in mind--a high ground idle is not desirable from many aspects, e.g. more fuel consumed, greater brake wear, etc. Apply an air load to the engine (two air conditioning packs) when setting idle, and the results will be much more realistic and easily obtained.

14. Deceleration Schedule Adjustment - RB 211

A. Service experience with recently calibrated fuel flow regulators shows that the additional fuel provided by a deceleration schedule change prevents adjusting the ground idle on some engines to the desired 23% N1 or 61 through 63% N3.

B. When a high ground idle that cannot be reduced by adjustment of the idle adjusting screw is experienced, it is permissible to adjust the DCU adjusting screw. One turn clockwise should be sufficient to allow normal adjustment of the ground idle; however, two turns clockwise can be used if needed.

15. Thrust Lever Alignment

A. Significant improvements were made to thrust lever alignment by FFR washes, rig checks, and FFR adjustments. Recent flight squawks indicate the need to review troubleshooting in correcting alignment problems.

B. One of the most prevalent problems seems to stem from the amount of misalignment. While this depends upon captain's discretion, the following is considered acceptable and will

R EFFECTIVITY: ALL

001B

71-00-00
Page 237
Jun 15/95



apply when making corrections to alignment. Depending on the situation, weather, crew, etc., alignment corrections may be deferred per MCIMD and corrected at a later time.

C. Alignment limits:

(1) One-half knob spread between thrust levers during takeoff and approach.

(2) One knob spread between thrust levers for all other flight regimes.

D. Troubleshooting alignment:

(1) Check thrust lever rig. (Refer MM 76-11-00, Page 201).

(2) Wash FFR per M11-73-03.

NOTE: Due to the inability to determine which engine is in error, all three engine FFRs should be washed and rig checked.

E. FFR adjustments:

(1) Adjust maximum power adjuster. (One complete turn alters EPR by 0.008 at takeoff).

(a) To move thrust lever aft (lean condition), adjust max adjuster counter clockwise.

(b) To move thrust lever forward (rich condition), adjust max adjuster clockwise.

NOTE: Normally, attempting to adjust the thrust lever forward (clockwise on the adjuster) will have little or no effect. This is because the FFR rarely has a rich shift but historically shifts lean. To compensate for this - when a thrust lever is aft, adjust the others for a lean condition and move them aft (adjust max adjuster counter clockwise).

NOTE: Remember this rule of thumb: Generally thrust levers can be moved back (counter clockwise); thrust levers cannot be moved forward by moving the max adjuster.

Advise MCIMD and MCIEE when the max adjuster is bottomed out in case further maintenance is necessary.

R EFFECTIVITY: ALL

001B

71-00-00
Page 238
Jun 15/95



MAINTENANCE MANUAL

R 16. Engine Preparation for Ground Running After Module or
 R Mini-Module Replacement

R A. When the aircraft is used to test an engine which has had a
 R module or mini-module change and has not been tested on a
 R static test bed prior to installation, a 3-micron slave
 R filter element must be installed in the oil pressure filter
 R (Ref. Fig. 205).

R Equipment and Materials

R Slave Oil Pressure Filter, PN 1012117
 R Oil Filter Bowl Slave Cover, HU30589
 R Container - Capacity
 R 4.0 U.S. Pints
 R 3.0 Imperial Pints
 R 2.0 Liters
 R Engine oil

R Referenced Procedures

R 12-12-01 Engine Oil Replenishing
 R 70-02-01 Identification, Lubrication and Fitting of Rubber
 R Sealing Rings
 R 70-51-00 Torque Tightening Techniques
 R 71-00-00 Power Plant - Adjustment and Test
 R 71-11-00 Cowlings, Engines No. 1 and No. 3 - Servicing
 R 71-12-01 LH and RH Lower Hinged Cowls - Servicing

R WARNING: THE SYNTHETIC LUBRICATING OIL USED IN THIS ENGINE
 R MAY CAUSE IRRITATION AFTER PROLONGED OR REPEATED
 R SKIN CONTACT.

R IMMEDIATELY AFTER SHUT DOWN ENGINE OIL TEMPERATURE
 R REMAINS HIGH. THEREFORE EXTREME CARE MUST BE
 R OBSERVED WHEN WORKING NEAR TO, OR ON, ENGINE OIL
 R SYSTEM COMPONENTS AND TUBES.

R CAUTION: THE OIL SPECIFIED FOR USE IN THIS OIL SYSTEM IS
 R INJURIOUS TO PAINTWORK AND CERTAIN TYPES OF RUBBER
 R AND MUST NOT BE ALLOWED TO CONTAMINATE THOSE PARTS
 R OF THE ENGINE NOT NORMALLY IN CONTACT WITH IT.
 R ANY OIL SPILT DURING SERVICING MUST BE WIPED UP
 R IMMEDIATELY.

R CONTAMINATION BY MINUTE AMOUNTS OF CERTAIN
 R ALKALINE CLEANING FLUIDS CAN CAUSE COMPLETE
 R BREAKDOWN OF THE SYNTHETIC OIL. USE SCRUPULOUSLY
 R CLEAN CONTAINERS AND EQUIPMENT.

R DRAINED OIL MUST NOT BE RETURNED TO THE SYSTEM.

R EFFECTIVITY: ALL

001B

71-00-00
 Page 239
 Jun 15/95



MAINTENANCE MANUAL

- R (1) Open left hinged cowl, 413A or 423A for engines No. 1
R and No. 3 (Ref. 71-11-00), or 433AL for engine No. 2
R (Ref. 71-12-01).
- R (2) Put a container in position under filter to catch the
R oil.
- R (3) Loosen the three bolts (5) (Ref. Fig. 205) and let the
R oil drain into the container.
- R (4) Remove the three bolts (5), spring washers (4), washers
R (3) and end cover (6).
- R (5) Discard the seal ring (2) and filter element (1).
- R (6) Fit seal ring (11) (Ref. 70-02-01) to the HU30489 slave
R end cover (12).
- R (7) Put slave filter element (10) and slave end cover (12)
R on the filter housing and fit the bolts (7). Tighten
R the bolts (7) to the standard torque (Ref. 70-51-00).
- R (8) Do the oil leak test No. 2 (Ref. 71-00-00 Adjustment
R and Test).
- R (9) Service the engine oil system (Ref. 12-12-01).
- R (10) Close left hinged cowl, 413A or 423A for engines No. 1
R and No. 3 (Ref. 71-11-00), or 433AL for engine No. 2
R (Ref. 71-12-01).
- R (11) Do the applicable tests (Ref. 71-00-00 Adjustment and
R Test).

R B. Removal of the Slave Pressure Filter Element.

R Equipment and Materials

R Container - Capacity
R 4.0 U.S. Pints
R 3.0 Imperial Pints
R 2.0 Liters
R Kerosine
R Engine oil

R Referenced Procedures

R 12-12-01 Engine Oil Replenishing
R 70-02-01 Identification, Lubrication and Fitting of Rubber
R Sealing Rings
R 70-51-00 Torque Tightening Techniques
R 71-00-00 Power Plant - Adjustment and Test

R EFFECTIVITY: ALL

71-00-00
Page 240
Jun 15/95



MAINTENANCE MANUAL

R 71-11-00 Cowlings, Engines No. 1 and No. 3 - Servicing
 R 71-12-01 LH and RH Lower Hinged Cows - Servicing

R WARNING: THE SYNTHETIC LUBRICATING OIL USED IN THIS ENGINE
 R MAY CAUSE IRRITATION AFTER PROLONGED OR REPEATED
 R SKIN CONTACT.

R IMMEDIATELY AFTER SHUT DOWN ENGINE OIL TEMPERATURE
 R REMAINS HIGH. THEREFORE EXTREME CARE MUST BE
 R OBSERVED WHEN WORKING NEAR TO, OR ON ENGINE OIL
 R SYSTEM COMPONENTS AND TUBES.

R CAUTION: THE OIL SPECIFIED FOR USE IN THIS OIL SYSTEM IS
 R INJURIOUS TO PAINTWORK AND CERTAIN TYPES OF RUBBER
 R AND MUST NOT BE ALLOWED TO CONTAMINATE THOSE PARTS
 R OF THE ENGINE NOT NORMALLY IN CONTACT WITH IT.
 R ANY OIL SPILT DURING SERVICING MUST BE WIPED UP
 R IMMEDIATELY.

R CONTAMINATION BY MINUTE AMOUNTS OF CERTAIN
 R ALKALINE CLEANING FLUIDS CAN CAUSE COMPLETE
 R BREAKDOWN OF THE SYNTHETIC OIL. USE SCRUPULOUSLY
 R CLEAN CONTAINERS AND EQUIPMENT.

R DRAINED OIL MUST NOT BE RETURNED TO THE SYSTEM.

R (1) Open left hinged cowl, 413A or 423A for engines No. 1
 R and No. 3 (Ref. 71-11-00), or 433AL for engine No. 2
 R (Ref. 71-12-01).

R (2) Put a container in position under filter to catch the
 R oil.

R (3) Loosen the three bolts (7) (Ref. Fig. 205) and let the
 R oil drain into the container.

R (4) Remove the three bolts (7), slave end cover (12) and
 R the slave oil pressure filter element (10).

R (5) Discard the seal ring (11) from the slave end cover
 R (12).

R (6) Clean end cover (6) with kerosine.

R (7) Lubricate with clean engine oil and fit seal ring (2)
 R (Ref. 70-02-01) in end cover (6).

R (8) Soak new pressure filter element (1) in clean engine
 R oil.

R (9) Put pressure filter element (1) in end cover (6) and
 R install in filter housing.

R EFFECTIVITY: ALL
 R

001B

71-00-00
 Page 241
 Jun 15/95

LOCKHEED



MAINTENANCE MANUAL

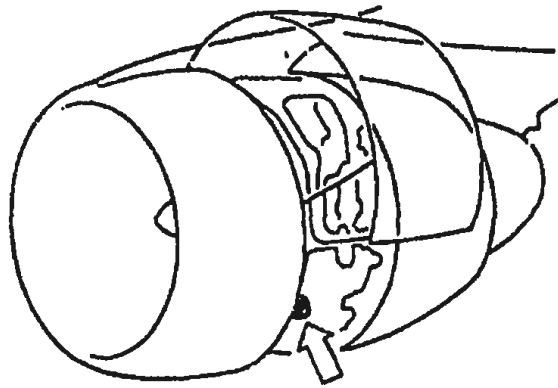
- R (10) Fit three washers (3), spring washers (4) and three
R bolts (5).
- R (11) Torque tighten bolts (5) to the standard torque
R 70-51-00).
- R (12) Do the oil leak test No. 2 (Ref. 71-00-00 Adjustment
R and Test).
- R (13) Service the engine oil system (Ref. 12-12-01).
- R (14) Close left hinged cowl, 413A or 423A for engines No. 1
R and No. 3 (Ref. 71-11-00), or 433AL for engine No. 2
R (Ref. 71-12-01).

R EFFECTIVITY: ALL
R

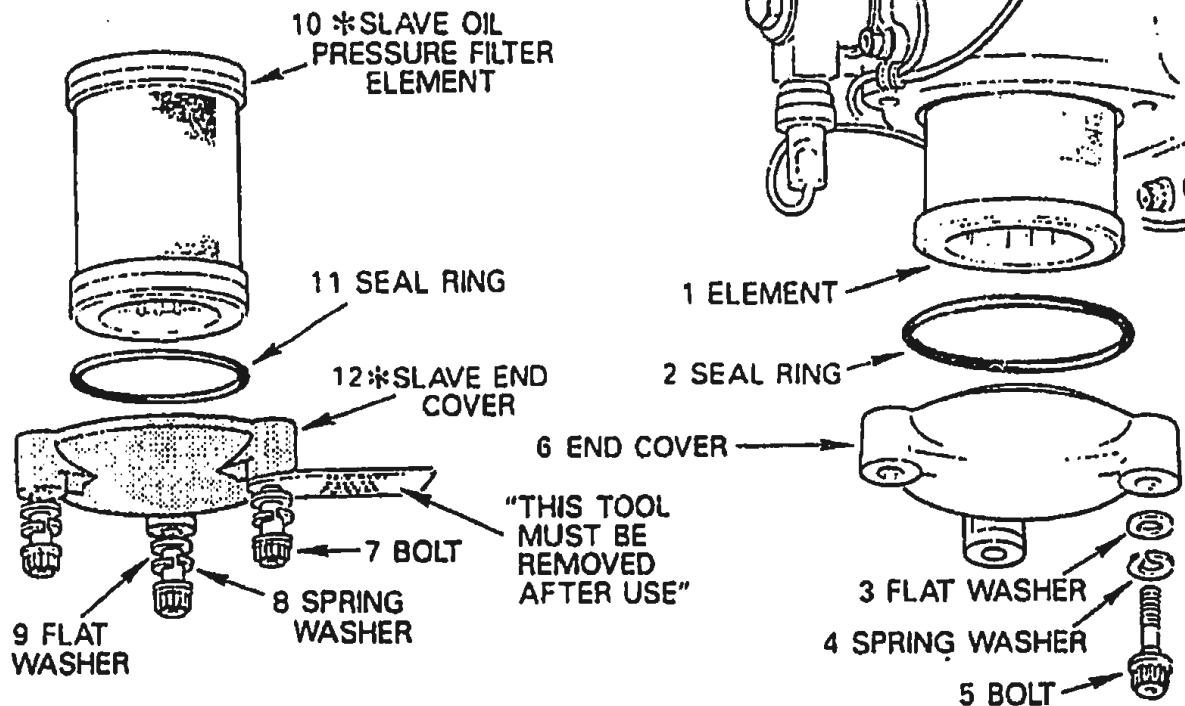
001B

71-00-00
Page 242
Jun 15/95

LOCKHEED
MAINTENANCE MANUAL



← FORWARD



 Parts painted in red

* Parts of test tools

C8017
M1-0000-71-808

R Slave Pressure Filter Element - Removal and Installation
R Figure 205

R EFFECTIVITY: ALL

001B

71-00-00
Page 243/244
Jun 15/95



RB.211 Propulsion System

MAINTENANCE

POWER PLANT - ADJUSTMENT/TEST

	<u>CONTENTS</u>	<u>Page</u>
	1. Propulsion System Tests Instructions	502
	2. Oil Circulation and Fuel Drains Test - Test No.1	511
C	3. Ground Idle/Flight Idle Test - Test No.2	512
C	4. I.P. Compressor Airflow Control Test - Test No.3	513
C	5. Running-in and Handling Test - Test No.4	516
C	6. Fuel and Oil Leak Test - Test No.5	517
C	7. Performance Test - Test No.6	520
C	8. Acceleration and Deceleration Test - Test No.7	522
C	9. Amplifier Redatum and Override Test - Test No.8	524
C	10. No. not used in order to relate test numbering to Overhaul Schedule	
C	11. Vibration Survey - Test No.10	527
C	12. Take-off Power Test - Test No.11	530
C	13. Anti-ice System Test - Test No.12	531
C	14. Thrust Reverser Test - Test No.13	532
C	15. Fuel Flow Regulator Throttle Angle/E.P.R. Test - Test 14	533
CR	15A. Fuel Flow Regulator Throttle Angle/E.P.R. Alternate Test - Test 14A	535
C	16. L.P. Compressor Rotor Trim Balancing to Reduce Cabin Noise - Test No.16	540
R		
C	16A. L.P. Compressor Rotor Trim Balancing Using the PBS-4000 Portable Balancing System - Test No.16A	549
CR	17. Oil System Filter Contamination Test - Test No.17	567
R	18. Fuel Control Amplifier Function Test - Test 18	568
CR	19. Test 19 Low Pressure Fuel Pump Drive Test	569
	Test number 19A (Alternate Procedure Low Pressure Fuel Pump Drive Test	570
R		
	20. No. not used in order to relate test numbering to Overhaul Schedule	
	21. Low Ambient Temperature H.P. Compressor Drum Oil Contamination Test	571
R		
R	22. Propulsion System Adjustments	572
CR	A. Adjust Idle R.P.M.	572
CR	B. Adjust Acceleration	572
CR	C. Adjust Deceleration	573
CR	D. Adjust Maximum Power	573
CR	E. Adjust I.P. Compressor Airflow Control System	574

EFFECTIVITY: ALL

050B

8G

71-00-00

Page 501
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

1. Propulsion System Test Instructions

To establish the ground running tests required refer to Table 501 and read across from appropriate item.

Table 501 gives the minimum test requirements after rework indicated, but these may be extended at operators discretion.

During ground running, air offtakes and engine inlet anti-icing should be selected off. If icing conditions prevail refer to 71-00-00, Maintenance Practices.

Outside air temperature (O.A.T.) and pressure altitude readings should be obtained immediately prior to commencement of test and at frequent intervals during tests in changing conditions.

Where it is required to carry out a number of tests they should, where possible, be accomplished concurrently to avoid unnecessary running. This applies to all except test No.4 (Running-in Handling).

During engine running, main parameters should be monitored to ensure that Operating Limitations (Ref. 71-00-00, Maintenance Practices) are not exceeded.

Additional engine parameters to those called for in tests may be recorded, as required, for performance trend analysis.

If a blast fence is used, the aircraft should be positioned with the propulsion system exhausts at least 150 feet from the blast fence.

Tests are written as individual tests. When accomplished as a sequence of tests, the starting and stopping referred to for intermediate tests need not apply.

Throttle lever movements, unless otherwise stated in a particular test, should be smooth and slow (e.g. minimum of 30 seconds between points).

R Before the start of a test sequence on an engine which has had
R modules or mini-modules replaced, but has not been tested on a
R static test bed before installation, install a 3-micron slave
R oil pressure filter (Ref.71-00-00, Maintenance Practices).

EFFECTIVITY: ALL

050B

8G

71-00-00
Page 502
Dec 15/95



RB.211 Propulsion System

MAINTENANCE

- R On completion of test sequence following a module or mini-module change on an engine which has not been tested on a static test bed prior to installation, remove and inspect master and external gearbox magnetic chip detectors and fine scavenge filter (Ref. 72-01-00, Removal/Installation and Inspection/Check).
- R Remove the 3-micron slave oil pressure filter and install a standard 30-micron filter (Ref.71-00-00, Maintenance Practices).
- C Test 4 when called out must be completed without engine shutdown; must be accomplished first before any other test; or going to any power above flight idle unless an emergency arises.
- C Warm up engine at ground idle of 5 minutes minimum before going to higher power and cool down of 5 minutes minimum before shutdown. Individual tests except for Test 4 may be run concurrently to avoid unnecessary running. It is not required to hold 5 minutes at idle cool down or warm up between tests.
- C Tests 3, 4 and 6 must be conducted under the direct supervision of an LST or Supervisor who has been adequately trained.
- C A. Before dehanging aircraft:
- C (1) Using the UT1000 tester, check the cockpit TGT indicator accuracy per instructions.
- C (2) Using the EPR checker, check the accuracy of the EPR transmitter/indicator per instructions.
- C (3) TGT must agree with tester within 2 degrees C. and IEPR must agree with tester within 0.004. Differences in IEPR or TGT greater than these must be taken into account when plotting the data.
- C (4) TGT and IEPR checking may be omitted and aircraft indication used as is without calibration when Test 6 is run for an on wing 02 Module change only.
- C B. After dehanging aircraft but before test
- C (1) Obtain the thermometer from the engine trim kit and secure under the nose of the aircraft.
- C (2) From tower, record wind velocity and direction. Check against wind sock where possible.

EFFECTIVITY: ALL

0508

8G

71-00-00

Page 503
Dec 15/95



RB.211 Propulsion System

MAINTENANCE

(3) Head aircraft into wind. If stalling or rushing noise is encountered during test, recheck wind direction and reposition aircraft as required.

(4) Zero aircraft altimeter and obtain barometer reading.

C. Plotting test results

(1) N2 EPR plot. All power points must be within tram lines for 22B.

(2) DELETED.

(3) DELETED.

(4) All parameters must be below maximum lines.

(5) Aircraft instruments may be used instead of a ground test set provided their accuracy is checked prior to run up. At LAX a digital N2 readout has been provided and should be used during Test 6. Also a digital cockpit TGT readout has been provided and should be used to check A/C instruments on Marginal or Over Limit TGT plots.

(6) When compressor airflow test (Test No.3) is called out after an O2 Module change, do Test No.6 first. If the IEPR N2 plot is within the band, Test No.3 may be omitted. If any point is outside the band, minor adjustments (4 clicks) of the master ram may be made to put N2 in the band. Do RAM Travel and Variable Inlet Guide Vane (VIGV) Pull Check and insure O.K. before doing Test 3. If any point is still out of band, then Test No.3 should be made and corrective action taken.

NOTE: There are now two types of master rams:

Those, as we have used in the past, where one click changes N2 by .5 to .7%; and a later version incorporating Mod.72-2178 (Plessy S.B.75-13), where one click alters N2 by approximately .35%. On the later version, four clicks may be made to put N2 in the band. The adjuster housing on the latter style may be identified by the words "Fine adj."

EFFECTIVITY: ALL

71-00-00

Page 504
Dec 15/95

050B

86



BB.211 Propulsion System

MAINTENANCE

. C D. Test engine pressure ratio transmitter and indicator

C (1) General

- C (a) In order to assure EPR accuracy for on wing
C testing the following test must be accomplished.
- C (b) This test will include the transmitter, the EPR
C trimmer and the cockpit indicator.
- C (c) Conduct test in accordance with 77-11-00,
C Page 501. If IEPR error is greater than + .004
C the on-wing test may be made by taking error into
C account. If error is .004 or less it may be
C disregarded. Complete IEPR test data sheet
C 77-11-00, Page 504 take-off (28Hg-14Hg).

C E. Test TGT system

C (1) General

- C (a) In order to assure TGT accuracy for on wing
C testing the following test must be accomplished.

C (2) Equipment and Materials

- C (a) UT1000/1 Test Set

C (3) Prepare for Check

C NOTE: See Adjustment/Test, 77-21-00, Page 502 for
C procedure.

C (4) Check Points and Limits

C (a) Set tester to read	Cockpit should read
C 700 deg.C.	700 deg.C. + 2 deg.
C 600 deg.C.	600 deg.C. + 2 deg.
C 540 deg.C.	540 deg.C. + 2 deg.



RB.211 Propulsion System

MAINTENANCE

R F. Notes for high oil consumption or oil replenishment high.

CAUTION: MAKE SURE THE CALCULATED OIL CONSUMPTION IS NOT MORE THAN THE USABLE OIL AVAILABLE IN THE ENGINE FOR THE NEXT FLIGHT. THIS IS TO MAKE SURE THE ENGINE CAN COMPLETE THE FLIGHT WITH SUFFICIENT OIL.

- (1) For comparison with limits (71-00-00 Maintenance Practices), the engine oil consumption should be based on a reasonable accumulation of hours running and/or cycles as a single oil replenishment may be misleading. This may be achieved by either:
 - (a) Applying a trend monitoring approach to oil consumption so that any deviations from normal can be identified.
 - or (b) Averaging the high reported oil consumption figure with the oil consumption over the previous 25 hours service (or 2 cycles if this constitutes a larger total running time).
- (2) If the reported oil replenishment indicates that a substantial loss of oil has occurred, trouble shooting (79-00-00 Fault Isolation) should be carried out immediately. An associated increase in the level of indicated vibration suggests that oil has entered the HP compressor drum and the engine must be removed for inspection of the HP system.
- (3) Temporary operation of an engine with high oil consumption until convenient for removal may be possible subject to local Airworthiness Authority agreement. It is also conditional on the consumption being stable, there being no other indications of abnormality and the operation being restricted such that oil range is not compromised.
- (4) A normal characteristic of the RB211 engine is that it uses more oil at low power than at high power, prolonged ground running at idle may therefore cause temporary exceedance of the oil consumption limit.
- (5) During any testing the oil quantity should be monitored together with the replenishment after test. Should substantial loss of oil quantity be indicated troubleshooting for high oil consumption should be carried out.

EFFECTIVITY: ALL

050B

8G

71-00-00
Page 506
Mar 15/91



RB.211 Propulsion System

MAINTENANCE

C	ITEM	TEST REQUIRED
C C C	Engine which is new or repaired and has been tested on a static test bed prior to installation	* 2, 8, 12 and 13
C C	Engine which has not been run for four days or more	17
C C C C C C	Engines which have been repaired and had the following modules or assemblies repaired or replaced and not tested on a static test bed prior to installation	* 2, 8, 12 and 13 plus the following
C C C	Module 01 - L.P. Compressor (Fan) - L.P. Compressor Disc and Blades	* 2 and 10 * 2 and 10
C C C	Module 02 - I.P. Compressor - I.P. Compressor Front Bearing Housing and I.G.V. Operating Mechanism	* ** 3, 4, 6, 7 and 10 * 3 or (mini test 6)
C C	<u>NOTE:</u> Test No.3 to be done only if N2 EPR relation in Test 6 is out of limits or as required for Fault Isolation.	
C	Module 03 - Intermediate I.P./L.P. Compressor Location Bearing	* ** 5
	Module 03/2 - H.S. External Gearbox Radial Drive Housing	1 and 5

Test required
Table 501 (Sheet 1)

R
R
050B

EFFECTIVITY: ALL

8G

71-00-00
Page 507
Mar 15/91



RB.211 Propulsion System

MAINTENANCE

	<u>ITEM</u>	<u>TEST REQUIRED</u>
C	Module 04 - H.P. System	* ** 4,5,6,7 and 10
C	Combustion Liner	* 5
C	H.P. Nozzle Guide Vanes	* 6
C	- H.P. Turbine Disc and Blades	* 4, 6 and 10
C	Module 05 - L.P. and I.P. Turbine	* ** 4,6,7 and 10
C	Module 06 - H.S. External Gearbox	* 2
C	Thrust Reverser	13
C	Fuel Pump	8r
C	Fuel Flow Regulator	2
C	Fuel Spray Nozzle	5
C	Fuel Manifold	5
C	Anti-icing Regulator/Shut-off Valve	12
C	Oil Distribution System Flow Test	5
C	Propulsion System Shock Load	2,5 and 10
C	* Test 1 not required if engine has been motorized and leak checked prior to run up.	
C	**For specific rework items relative to this test refer to Table 501 (Sheet 2)	
C	; Functional Test (Ref. 73-11-01, Maintenance Practices) may be an alternative	
C	<u>NOTE:</u> 1. Modules 02, 04 and/or 05 moved from one engine to another without shop repair that has previously been run on the aircraft or through an on-wing test does not require Test 4.	
C	2. When fuel/oil connections have been disturbed, Test 5, Fuel and Oil Leak Test must be performed.	

Tests Required
Table 501 (Sheet 2)

R EFFECTIVITY: ALL
R
050B

86

71-00-00
Page 508
Mar 15/91



RB.211 Propulsion System

MAINTENANCE

- This table of component rework items is provided to assist operators to determine which engines require running-in (Test 4) following rework by repair or replacement.

An engine need not be run-in unless one or more of the following items of rework has been effected.

MODULE 02

New rotor path abradable linings
New stator inner shroud abradable linings
New rotor blades
New abradable linings at:
I.P. Compressor front stepped air seal
I.P. Compressor rear stepped air seal

MODULE 04

H.P. Compressor:
New rotor path abradable linings
New stator inner shroud abradable linings
New rotor blades

H.P. Turbine:
New or repaired shroud segments
New turbine front air seal abradable linings

MODULE 05

New or repaired I.P. shroud segments
New or repaired L.P. shroud segments
New abradable linings at:
H.P. turbine rear stepped air seal
L.P.1 turbine front air seal
L.P.2 or L.P.3 N.G.V. inner shroud boxes

C

Table 501 (Sheet 3)

R
R
050B

EFFECTIVITY: ALL

8G

71-00-00
Page 509
Mar 15/91



RB.211 Propulsion System

MAINTENANCE

	<u>TEST</u>	<u>TYPE OF TEST</u>
	1	Oil Circulation and Fuel Drains Test
C	2	Ground Idle/Flight Idle Test
C	3	I.P. Compressor Airflow Control Test
C	4	Running-in Handling
C	5	Fuel and Oil Leak Test
C	6	Performance Test
C	7	Acceleration and Deceleration Test
C	8	Speed and Temperature Control Amplifier Redatum and Override Test
C	9	Number not used in order to relate test numbering to Overhaul Schedule
C	10	Vibration Survey
C	11	Take-off Power Test
C	12	Anti-ice System Test
C	13	Thrust Reverser Test
C	14	Fuel Flow Regulator Throttle Angle/E.P.R. Test
C	15	Number not used in order to relate test numbering to Overhaul Schedule
C	16	L.P. Compressor Rotor Trim Balancing to Reduce Cabin Noise
C	16A	L.P. Compressor Rotor Trim Balancing Using the P.B.S.4000
C		Portable Balancing System
	17	Oil System Filter Contamination Test
	18	Fuel Control Amplifier Function Test
	19	Low Pressure Fuel Pump Drive Test
	20	Number not used in order to relate test numbering to Overhaul Schedule
	21	Low Ambient Temperature H.P. Compressor Drum Oil Contamination Test

Table of tests
Table 502



RB.211 Propulsion System

MAINTENANCE

2. Test No.1 - Oil Circulation and Fuel Drains Test

- R A. If the engine has had a module or mini-module replaced and
R has not been tested on a static test bed before installation,
R install a 3-micron slave oil pressure filter element
R (Ref. 71-00-00, Maintenance Practices).
- B. Check engine oil level and replenish as necessary (Ref.
12-12-01).
- C C. Refer to 71-00-00, Maintenance Practices, para.10.A. and
carry out dry motoring cycle.
- C D. After 20 seconds of dry motoring close applicable circuit
C breaker FUEL SHUTOFF CB1 - F16, F17 or F18, then select FUEL
AND IGNITION switch ON.
- R E. Check fuel discharge from drain outlet on gas generator
turbine section lower fairing occurs within 20 seconds of
operation D., then select FUEL AND IGNITION switch OFF.
- F. Continue to motor engine for a further 20 seconds.
- G. Push GROUND START RELEASE switchlight (hold for 2 seconds)
to terminate motoring period.
- H. When N3 rotation has ceased:
- (1) Remove magnetic chip detectors (Ref.72-01-00,
Removal/Installation) at main scavenge strainers and
external gearbox. Unseat self sealing valves and
check that oil has circulated.
- NOTE: If magnetic chip detector position is blanked,
remove blank plug.
- (2) Fit magnetic chip detectors and/or blank plugs (Ref.
72-01-00, Removal/Installation).
- R CAUTION: WHEN THE ENGINE TEST IS COMPLETE, THE 3-MICRON SLAVE
R FILTER MUST BE REPLACED WITH A STANDARD 30-MICRON FILTER
R BEFORE FLIGHT.
- R J. Remove the 3-micron slave oil pressure filter element if it
R was installed at para.2.A. and install a standard 30-micron
R oil pressure filter element (Ref. 71-00-00, Maintenance
R Practices).

EFFECTIVITY: ALL

0508

8G

71-00-00
Page 511
Dec 15/95



RB.211 Propulsion System

MAINTENANCE

K. 10 minutes after N3 rotation has ceased, check engine oil level (Ref. 12-12-01).

R NOTE: If operation H involved removal of blank plugs and a
R significant oil loss, carry out 30 seconds dry
motoring before performing operation K.

L. Remove tags and close circuit breakers opened at commencement of dry motoring cycle.

C 3. Test No.2 - Ground Idle/Flight Idle Test

A. Obtain and record O.A.T.

B. Start engine (Ref. 71-00-00, Maintenance Practices, para.9.).

C. Warm up engine 5 minutes at ground idle minimum if not previously run.

C D. Select IDG - ON (20 KW Load Desired)

C ENG. ISLN VALVE FLOW BAR LIGHT ON
C HI PRESSURE VALVE FLOW BAR LIGHT ON
Hyd Pump Press - 3000 PSIG
Air Cycle Packs - 2 ON

C E. Obtain indicated N3 % optimum by entering N3 Idle Graph at
C OAT recorded in 3.A. Proceed vertically to optimum line and
C left to N3 indicated (Ref. Figure 522, N3 Idle Graph).

C F. Set idle RPM to N3 obtained in Step 3.E. above.

C NOTE: 1/8 turn alters N3 RPM by approx. 1.0%
C (CCW-INC, CW-DEC).

C G. Pull Ground Idle CIRCUIT BREAKER, after speed stabilizes
C record N3 Flight Idle, N3 speed must increase a minimum of 5%.

C H. Reset ground idle CIRCUIT BREAKER.

C J. Advance throttle lever to approximately half throttle travel
C position in less than 1 second and record time for engine to
C accelerate from ground idle to N3 recorded in operation G.
When engine accelerates to this N3 close throttle lever.

EFFECTIVITY: ALL

050B

8G

71-00-00

Page 512
Dec 15/95



RB.211 Propulsion System

MAINTENANCE

- . C K. If acceleration time is greater than 8 seconds refer to
C 71-84-00, Fault Isolation.
- C L. Stop engine (Ref. 71-00-00, Maintenance Practices,
C para.11.A.).
- C 4. Test No.3 - I.P. Compressor Airflow Control Test
- C This test uses the parameter of N2 (corrected) and gauge
C E.P.R., and requires no test equipment.
- C The N2/E.P.R. test can be effected as part of the engine
C running-in procedure (Test No.4) or as an individual test.
C When effected as part of the running-in procedure the power
C settings (incremental and decremental), run times and throttle
C lever movements must be strictly adhered to.
- C A. N2/E.P.R. Tests
- C (1) N2/E.P.R. Test - Effected as part of engine running-in.
- C (a) Obtain and record O.A.T. and pressure altitude.
- C (b) Deleted.
- C (c) Start engine (Ref. 71-00-00, Maintenance Practices,
para.9.).

Engine condition: No air offtake, I.D.G.
disconnected or minimum load of 5 kilowatts.
- C (d) Run engine at ground idle for 5 minutes. This
operation can be omitted providing 5 minute run
at ground idle in starting engine has been
accomplished.
- C (e) On Flight Engineers/Second Officers aft circuit
breaker panel CB3, zone 215, open and tag ENG.
IDLE circuit breaker (N2, N8 or N14).

CAUTION: THROTTLE LEVER MOVEMENT BETWEEN POWER
SETTINGS MUST BE SMOOTH AND OF THE
DURATION STATED.



RB.211 Propulsion System

MAINTENANCE

- C (f) Advance throttle lever to achieve the following
C power settings with throttle lever movement of
C 10 seconds between each setting. Run engine at
C each setting for time stated then record
C indicated N2. Calculate corrected N2 (Ref.
CR fig.518) and check within limits given on fig.515
C before accelerating to next power setting.
- | C | E.P.R. | RUN TIME |
|----|--------|-----------------------------|
| CR | 1.35 | 1 minute) Ensure operating |
| CR | 1.47 | 1 minute) limitations are |
| CR | T.O. | 1 minute) not exceeded |
- C On completion of check at take-off E.P.R., check
CR that the 3 corrected N2 points plotted are
C approximately parallel with the limit line on
C fig.515.

EFFECTIVITY: ALL

050B

8G

71-00-00

Page 514
May 15/90



RB.211 Propulsion System

MAINTENANCE

C B. N2/E.P.R. Test - Effected concurrent with Test No.4

C (1) CAUTION: WHEN EFFECTING TEST NO.3 ON AN ENGINE THAT
C HAS NOT BEEN RUN IN (TEST NO.4) IT IS
ESSENTIAL THAT DECELERATION FROM THE TOP
SCHEDULING POINT BE ACCOMPLISHED IN
DECREMENTAL STEPS. FAILURE TO DO SO
C MAY RESULT IN ENGINE SIEZURE IF SHUTDOWN
BEFORE TEST NO.4 IS COMMENCED.

Open and tag ENG IDLE circuit breaker (N2, N8 or N14)
on Flight Engineers/Second Officers aft circuit
breaker panel CB3, Zone 215. Then decelerate from
the top scheduling point in decremental steps as
follows:

R	(a)	1.42 E.P.R.	1 minute soak	)	
				)	
R	(b)	1.32 E.P.R.	1 minute soak	)	
				)	
R	(c)	1.22 E.P.R.	1 minute soak	)	10 second
				)	throttle
R	(d)	1.12 E.P.R.	1 minute soak	)	movements
				)	
	(e)	Flight Idle	5 minute soak	)	

C (2) Proceed immediately to Test No.4 handling cycles.

C (3) If it becomes necessary to terminate Test No.3 during
the five test points (Ref.para.A.) decelerate
engine from E.P.R. achieved using relevant
decremental steps. Run for 5 minutes at Ground
Idle and then shut down.

C (4) If it becomes necessary to shut down on completion
of decremental steps, on restart run for 5 minutes
at Ground Idle and then 5 minutes at Flight Idle
before entering into handling cycles (Ref.Test No.4).

(5) If I.D.G. disconnected prior to run, reconnect I.D.G.

EFFECTIVITY: ALL

050B

8G

71-00-00
Page 515
Jun 15/92



RB.211 Propulsion System

MAINTENANCE

C 5. Test No.4 - Running-in Handling

C When this test is required it must be accomplished without engine
C shutdown; must be accomplished first, before any other test;
C and must be completed before proceeding to performance and
C accel/decel tests.

C CAUTION: THROTTLE LEVER MOVEMENT BETWEEN POWER SETTINGS MUST
C BE SMOOTH AND OF NOT LESS THAN 30 SECONDS DURATION.

R A. If the engine has had a module or mini-module replaced and
R has not been tested on a static test bed before installation,
R install a 3-micron slave oil pressure filter element
R (Ref. 71-00-00, Maintenance Practices).

C B. Obtain and record OAT and pressure altitude.

C C. Establish and record take-off EPR (Ref. Fig.514).

C D. Start engine (Ref. 71-00-00 Maintenance Practices, Para.9.).

C (1) Select: IDG - One (10 KW)
C Hydraulic pumps - Pressurized (3000 psig)
C Air outlets - Off

C (2) Run at ground idle for 5 minutes. Shut down engine.
C Check core engine for fuel and oil leaks. Restart
C engine and run for 5 minutes more at ground idle.

C (3) Run at flight idle for 5 minutes.

C E. Advance throttle lever slowly to achieve 1.10 EPR and run
C at this power setting for 5 minutes; then advance throttle
C lever slowly to achieve, in turn, 1.35, 1.40 and takeoff
CR EPR recorded in Step C. Run at each power setting for a
C minimum period of 2 minutes.

C F. Retard throttle lever slowly to achieve in turn 1.35
C IEPR and flt. idle. Run at each setting for a minimum
C period of 1 minute.

C G. Advance throttle lever slowly to achieve takeoff EPR and
C run at this power setting for a minimum period of 1 minute.

C H. Retard throttle lever slowly to 1.35 IEPR and run for 1
C minute.

EFFECTIVITY: ALL

050B

8G

71-00-00
Page 516
Dec 15/95



RB.211 Propulsion System

MAINTENANCE

- C J. Close throttle to ground idle and run for 5 minutes.
- C K. Proceed with next test (Ref. Table 501) without stopping engine.
- C
- R CAUTION: WHEN THE ENGINE TEST IS COMPLETE, THE 3-MICRON SLAVE
R FILTER MUST BE REPLACED WITH A STANDARD 30-MICRON FILTER
R BEFORE FLIGHT.
- R L. Remove the 3-micron slave oil pressure filter element, if it
R was installed at para.5.A. and install a standard 30-micron
R oil pressure filter element (Ref.71-00-00, Maintenance
R Practices).

C 6. Test No.5 - Fuel and Oil Leak Test

Where the following test calls for engine running up to ground idle, the gas generator fairings can be removed if required. However, where the test calls for engine running above ground idle, then the gas generator fairings must be installed.

A. Equipment required:

	British Spec./Ref.	American Spec./Ref.	OMat Item No.
Chalk mixture	Ardrox 9D2		617
Small, clean brush		SKD-NF	618A

- B. Gain access to area of rework. Remove is necessary, gas generator fairing (Ref.72-03-00, Removal/Installation).
- C. Check engine oil level (Ref.12-12-01).
- D. Using brush or aerosol spray, apply chalk mixture to oil and fuel tube connectors, and high-speed external gearbox drive and housing.
- E. Refit if necessary, gas generator fairings (Ref.72-03-00 Removal/Installation).
- F. Where work has been effected in areas other than the H.P. Fuel Filter connections, perform the following test.
- (1) Start engine (Ref. 71-00-00, Maintenance Practices, para.9.)

EFFECTIVITY: ALL

050B

86

71-00-00
Page 517
Dec 15/95



RB.211 Propulsion System

MAINTENANCE

- C (2) Run engine at ground idle for 5 minutes. This operation can be omitted provided 5 minute run at ground idle called for when starting the engine (Ref. 71-00-00, Maintenance Practices, para.9.D.) has been accomplished.
- C (3) Stop engine (Ref. 71-00-00, Maintenance Practices, para.11.A.).
- (4) Remove, if necessary, turbine section lower fairing (Ref.72-03-00, Removal/Installation).
- (5) Examine chalked areas for leakage discolouration; if no leaks apparent continue with operation (7). If leaks apparent, rectify as necessary, wipe off discoloured chalk, apply new chalk mixture to rectified areas, refit turbine section lower fairing (Ref. 72-03-00, Removal/Installation) if removed at operation (4) and effect operation (6).
- (6) Repeat operations (1) through (5) with particular monitoring of oil quantity and pressure, fuel pressure and engine vibration during operation (2), and recheck for leaks.
- (7) Clean chalked areas then fit gas generator fairings if necessary (Ref. 72-03-00, Removal/Installation).
- G. Where work has been effected that disturbed the H.P. Fuel Filter connections, perform the following test.

C CAUTION: WHERE ENGINES REQUIRE RUNNING IN FOLLOWING REWORK BY REPAIR OR REPLACEMENT (REF. TABLE 501 (SHEET 3)). THEN TEST NO.4 MUST BE ACCOMPLISHED BEFORE EFFECTING THE FOLLOWING TEST.

Before effecting this test, read Propulsion System Test Instructions, paragraph 1.

- C (1) Obtain and record O.A.T. and pressure altitude.
- (2) Refer to fig.514, establish and record take off E.P.R. for the day.
- (3) Start engine (Ref.71-00-00, Maintenance Practices, para.9.).

R EFFECTIVITY: ALL

R
050B

8G

71-00-00
Page 518
Dec 15/95



RB.211 Propulsion System

MAINTENANCE

- C
- (4) Run engine at ground idle for 5 minutes. This operation can be omitted provided 5 minute run at ground idle called for when starting the engine (Ref.71-00-00, Maintenance Practices, para.9.D.) has been accomplished
- Engine condition: No air offtake, I.D.G. disconnected or a minimum load of 5KVA.
- (5) Slowly accelerate engine to maximum E.P.R. for the day recorded in (2) and run at this setting for 2 minutes.
- (6) Slowly decelerate engine to ground idle and run engine for 5 minutes at this setting. Stop engine (Ref.71-00-00, Maintenance Practices, para.11.A.).
- C
- (7) If I.D.G. disconnected, reconnect I.D.G.
- (8) Remove gas generator fairings (Ref.72-03-00, Removal/Installation).
- (9) Examine chalked areas for leakage discolouration; if no leaks apparent, continue with operation (12). If leaks apparent, perform torque tightening procedure (Ref.73-11-09, Removal/Installation), wipe off discoloured chalk and apply new chalk to filter connections.
- (10) Install gas generator fairings (Ref.72-03-00, Removal/Installation) and effect operation (11).
- (11) Repeat operations (3) through (9) with particular monitoring of oil quantity and pressure, fuel pressure and engine vibration during operation (4) and recheck for leaks.
- (12) Clean chalked areas then install gas generator fairings (Ref.72-03-00, Removal/Installation).
- H. If this test is carried out as one of a series of tests it is recommended that any rectified areas are rechecked on completion of tests.

R
R

050B

EFFECTIVITY: ALL

8G

71-00-00

Page 519
May 15/90



RB.211 Propulsion System

MAINTENANCE

C 7. Test No.6 - Engine Performance Test

R A. If the engine has had a module or mini-module replaced and
R has not been tested on a static test bed before installation,
R install a 3-micron slave oil pressure filter element
R (Ref. 71-00-00, Maintenance Practices).

C B. Obtain and record O.A.T. with a thermometer close to engine
C inlet. Obtain pressure altitude by selecting aircraft
C altimeter to 29.92 barometric and read indicated altitude.

C NOTE: Zero aircraft altimeter before reading.

C C. Establish and record IEPR for takeoff (Ref. 71-00-00). Note
C that all TWA engines incorporate S.B.72-8700.

C D. Test engine as follows:

C (1) Start engine (Ref. 71-00-00, Maintenance Practices)

C IDG - on (10 kw)
C Hydraulic pumps - pressurized (3000 psig)
C air outlets - off

C (2) Make normal 5 minute warmup at ground idle. If engine
C is already warmed up skip to (3).

C (3) Advance power lever to achieve approx 1.35 IEPR and
C run at this power for 1 min. Then record N2, IEPR,
C and O.A.T.

C (4) Correct N2 and plot N2 - IEPR to insure variable vane
C rig is (OK) in tram lines.

C (5) Advance power lever to achieve 1.474 IEPR or max
C power ref. fig.514 (which ever is lower). Stabilize
C for 4 minutes minimum. Record N1, N2, N3, TGT, IEPR,
C OIL PRESSURE and OIL TEMP.

C (6) Correct N1, N2, N3, and TGT to std day per fig.516 and
C plot on M11-71-06 (Ref. fig.515).

C (7) Check oil press vs temp limits (Ref. fig.519).

C (8) If not already done during seal run-in advance power
C lever to T.O. target slowly and insure that T.O.
C IEPR can be obtained.

EFFECTIVITY: ALL

050B

8G

71-00-00

Page 520
Dec 15/95



RB.211 Propulsion System

MAINTENANCE

- C (9) Correct N1, N2, N3 and T.G.T. to std day per fig.516
C and plot on M11-71-06 (Ref. fig.515).
- C (10) Insure that N2 plot is in tram lines or adjust rams as
C necessary to plot as top of line.
- C (11) Close power lever to ground idle.
- C (12) Stop engine (ref. 71-00-00 Maintenance Practices,
C Para.11.A).

R CAUTION: WHEN THE ENGINE TEST IS COMPLETE, THE 3-MICRON SLAVE
R FILTER MUST BE REPLACED WITH A STANDARD 30-MICRON FILTER
R BEFORE FLIGHT.

- R E. Remove the 3-micron slave oil pressure filter element, if it
R was installed at para.7.A. and install a standard 30-micron
R oil pressure filter element (Ref. 71-00-00, Maintenance
R Practices).

EFFECTIVITY: ALL

0508

8G

71-00-00
Page 521
Dec 15/95



RB.211 Propulsion System

MAINTENANCE

c 8. Test No.7 - Acceleration and Deceleration Test

Service Bulletins referred to:

S.B.73-5555 (Lucas S.B.FFR101-73-5746, MOD.CP5746) - Revised deceleration control unit calibration.

- A. Obtain and record O.A.T. and pressure altitude.
- R B. Refer to fig.514, establish and record take-off E.P.R.
- C. Subtract 0.024 from E.P.R. recorded in operation B. and set E.P.R. indicator cursor to the resultant figure.
- D. Start engine (Ref. 71-00-00, Maintenance Practices, Para.9.).
- E. Run engine at ground idle for 5 minutes. This operation can be omitted providing 5 minute run at ground idle in starting engine has been accomplished.
- F. Open and tag ENG. IDLE circuit breaker (N2, N8 or N14) on on Flight Engineer/Second Officers aft circuit breaker panel CB3, zone 215, and allow engine to run at flight idle for 2 minutes.
- G. Advance throttle lever to maximum forward position in less than 1 second and record time for engine to accelerate to E.P.R. set in operation C. Immediately on achieving this E.P.R. close throttle lever to idle.
- H. If acceleration time is less than 5 seconds (fast acceleration) adjust acceleration. If acceleration time is greater than 6 seconds (slow acceleration) refer to 71-84-00, Fault Isolation).
- J. Set E.P.R. indicator cursor to 1.05.
- K. Advance throttle lever to E.P.R. recorded in operation B. and allow engine to stabilize.
- L. Close throttle lever to idle position in less than 1 second and record time for engine to decelerate to 1.05 E.P.R.

EFFECTIVITY: ALL

050B

8G

71-00-00

Page 522
May 15/90



RB.211 Propulsion System

MAINTENANCE

M. If deceleration time is less than 5.5 seconds (fast deceleration) or greater than 8.0 seconds (slow deceleration) adjust deceleration.

On engines without S.B.73-5555: If a minimum time of 5.5 seconds cannot be attained by adjustment (i.e. deceleration time too fast) it is permissible to accept the longest time that can be achieved.

N. Close circuit breaker opened in operation F. and remove tag.

P. Run engine at ground idle for 5 minutes.

Q. Stop engine (Ref. 71-00-00, Maintenance Practices).
The 5 minute run called for under 71-00-00, Maintenance Practices, para.11.A., can be omitted providing operation P. has been accomplished.



RB.211 Propulsion System

MAINTENANCE

- C 9. Test No.8 - Speed and Temperature Control Amplifier Redatum and Override Test
- C A. Start engine (Ref. 71-00-00, Maintenance Practices, Para.9.).
- Engine condition: No air offtake I.D.G. disconnected or minimum load of 5 kilowatts.
- B. Run engine at ground idle for 5 minutes. This operation can be omitted provided 5 minute run at ground idle in starting engine has been accomplished.
- C. Advance throttle lever slowly to achieve following shaft speed depending on standard of amplifier fitted.
- (1) Amplifier STA 103 (without S.B.73-4916)
- 94% N2 (minimum) or if desired 88% N1 (approx.).
- NOTE: The N1 value will vary due to indicated N2/N1 relationship scatter between individual engines.
- (2) Amplifier STA 103 or STA 104 (with S.B.73-4916)
- 96% N2 (minimum) or if desired 91% N1 (approx.).
- NOTE: The N1 value will vary due to indicated N2/N1 relationship scatter between individual engines.
- (3) Amplifier SCA200
- 89% N2 (minimum) or if desired 84% N1 (approx.).
- NOTE: The N1 value will vary due to indicated N2/N1 relationship scatter between individual engines.
- D. If required shaft speed cannot be achieved in lower ambient temperatures without exceeding take-off E.P.R. (Ref. fig.514) or an unacceptable high power, the following procedure may be used:
- R

EFFECTIVITY: ALL

050B

8G

71-00-00

Page 524
May 15/90



RB.211 Propulsion System

MAINTENANCE

- (1) Reduce N2 datum setting by a required amount using N2 adjuster as detailed in 73-21-00, Adjustment/Test.

NOTE: Range adjustment for STA103 amplifiers (without S.B.73-4916) or SCA200 plus 3% to minus 3% from the nominal 102% N2 setting. For STA103 (with S.B.73-4916) plus 1% to minus 5% from the nominal 104% N2 setting.

- (2) CAUTION: ON COMPLETION OF TEST, OPERATION P. MUST BE CARRIED OUT TO RE-ADJUST THE N2 DATUM SETTING TO THE CORRECT VALUE USING THE TEST SET STATIC TEST (REF. 73-21-00, ADJUSTMENT/TEST).

Record amount of adjustment made to assist resetting N2 datum when detailed to in operation P.

- (3) Run engine at 7% to 8% (N2) below N2 datum set in para.(1) or if desired, equivalent % N1.

NOTE: The N1 value will vary due to indicated N2/N1 relationship scatter between individual engines.

- E. CAUTION: DO NOT ACTUATE FUEL CONTROL AMPLIFIER OVERRIDE SWITCH WHEN AMPLIFIER TEST SWITCH IS IN RESET POSITION.

Lift cover on pilots centre console, zone 210, and select fuel control amplifier test switch to reset position.

- F. Observe for small decrease in indicated N1 or N2 as appropriate then select test switch to normal position and observe that r.p.m. returns to that set in operation C or D (as appropriate).

NOTE: As the amplifier is designed to reset slowly there will be a delay of up to 60 seconds before a decrease in r.p.m. is effected.

 RB.211 Propulsion System
MAINTENANCE

- G. Select amplifier override switch zone 215, to override and check light comes on.
- H. Select amplifier test switch to reset position. There should be no decrease in r.p.m.
- J. Select amplifier test switch to normal position.
- K. Select amplifier override switch to normal and check light goes out.
- L. Close throttle lever to idle position.
- M. Run engine at ground idle for 5 minutes.
- N. Stop engine (Ref. 71-00-00, Maintenance Practices, Para.11.A.). The 5 minute run called for under 71-00-00, Maintenance Practices can be omitted providing operation M. has been accomplished.
- P. If N2 datum setting reduced in operation D reset N2 datum setting using test set static test as detailed in 73-21-00, Adjustment/Test to the following N2% datum.
 - (1) Amplifier STA103 (without S.B.73-4916) or SCA200 - 102% to 102.2% N2.
 - (2) Amplifier STA103 (with S.B.73-4916) - 104% to 104.2% N2.
- Q. If I.D.G. disconnected prior to run, reconnect I.D.G.

CR 10. No. not used in order to relate test numbering to Overhaul
CR Schedule

EFFECTIVITY: ALL

0508

8G

71-00-00
Page 526
May 15/90



RB.211 Propulsion System

MAINTENANCE

C 11. Test No.10 - Vibration Survey

- A. Obtain and record O.A.T. and pressure altitude.**
- R B. Refer to fig.514, establish and record take-off E.P.R. for day.**
- C. Start engine (Ref.71-00-00, Maintenance Practices).**
- Engine condition: No air offtake I.D.G. disconnected or minimum load of 5 kilowatts.**
- D. ON ENGINE STATUS PANEL, zone 215, ensure:**
- FAN or A switchlight selected - ON**
- TURB or B switchlight selected - OFF**
- Vibrations rotary switch - NORM**
- E. Run engine at ground (low) idle for 5 minutes. This operation can be omitted providing 5 minute run at ground (low) idle in starting engine has been accomplished.**
- F. Slowly advance throttle lever to achieve take-off E.P.R. and record the E.P.R. at which peak vibration occurs.**
- G. Decelerate to E.P.R. at which peak vibration was recorded in (F).**
- H. Record vibration meter reading with filter selection switch at NORM, then turn filter selection switch to LOW, MED and HIGH respectively and allow meter indication to stabilize at each selection record respective meter reading.**
- J. Turn filter selection switch to NORM. Release FAN or A switchlight to OFF. Press TURB or B switch light to ON.**
- K. Repeat operation H.**
- L. Turn filter selection switch to NORM and release TURB or B switchlight to OFF. Press FAN or A switchlight to ON.**
- M. Close throttle lever to ground (low) idle position and run engine for 5 minutes.**

EFFECTIVITY: ALL

050B

8G

71-00-00
Page 527
May 15/90



RB.211 Propulsion System

MAINTENANCE

- N. Stop engine (Ref.71-00-00, Maintenance Practices). The 5 minute run called for under 71-00-00, Maintenance Practices can be omitted providing operation M. has been accomplished.
- R P. If I.D.G. disconnected prior to run, reconnect I.D.G.
- R Q. If vibration level at any time and in any mode is outside limits (Ref.71-00-00, Maintenance Practices) investigate cause (Ref.71-91-00, Fault isolation).
- R R. For guidance to determine whether vibration meter reading is correct select either Channel A or B. The NORM reading plus or minus 10 per cent. should then equal:

The largest single value of LOW, MED or HIGH

+ half the next highest value squared

+ half the remaining value squared

EFFECTIVITY: ALL

050B

8G

71-00-00
Page 528
Mar 15/91



RB.211 Propulsion System MAINTENANCE

Example

1. True indication with channel A selected

NORMAL reading	2.2 units
LOW	1.1 units
MED	1.0 units
HIGH	1.8 units

Hence

$$\begin{aligned}\text{NORM should equal} & \quad \boxed{1.8 + (1.1/2)^2 + (1.0/2)^2} \quad + \text{ or } - 10\% \\ & = \boxed{1.8 + 0.30 + 0.25} \quad + \text{ or } - 10\% \\ & = 2.35 + \text{ or } - 10\% \\ & = 2.12 \text{ to } 2.58\end{aligned}$$

This is therefore a true reading as the normal reading of 2.2 units is within 10% of the calculated value.

2. False indication with channel B selected

NORMAL reading	2.0 units
LOW	1.2 units
MED	0.5 units
HIGH	0.6 units

$$\begin{aligned}\text{NORM should equal} & \quad \boxed{1.2 + (0.6/2)^2 + (0.5/2)^2} \quad + \text{ or } - 10\% \\ & = \boxed{1.2 + 0.09 + 0.06} \quad + \text{ or } - 10\% \\ & = 1.35 + \text{ or } - 10\% \\ & = 1.22 \text{ to } 1.49\end{aligned}$$

This is therefore a false reading as the NORMAL reading of 2.0 units is not within 10% of the calculated value.

59687

R
R
050B

EFFECTIVITY: ALL

8G

71-00-00
Page 529
May 15/90



RB.211 Propulsion System

MAINTENANCE

C 12. Test No.11 - Take-off Power Test

- A. Obtain and record O.A.T. and pressure altitude.
- R B. Refer to fig.514, establish and record take-off E.P.R.
- C C. Start engine (Ref. 71-00-00, Maintenance Practices, Para.9.).
Engine condition: No air offtake I.D.G. disconnected or minimum load of 5 kilowatts.
- D. Run engine at ground idle for 5 minutes. This operation can be omitted providing 5 minute run at ground idle in starting engine has been accomplished.
- E. Advance throttle lever to achieve take-off E.P.R. with throttle lever movement of 30 seconds minimum. Ensure operating limitations are not exceeded.
- F. Allow engine to stabilize then reposition throttle lever to accurately set take-off E.P.R. Record N1, N2, N3 and T.G.T. and check they are within limits (Ref. 71-00-00, Maintenance Practices. If any parameters not within limits investigate cause (Ref. 71-00-00, Fault Isolation).
- G. Close throttle lever to ground idle with throttle lever movement of 30 seconds minimum.
- H. Run engine at ground idle for 5 minutes.
- J. Stop engine (Ref. 71-00-00, Maintenance Practices, Para.11A.). The 5 minute run called for under 71-00-00, Maintenance Practices, Para.11A.) can be omitted providing operation H. has been accomplished.
- K. If I.D.G. disconnected prior to run, reconnect I.D.G.

EFFECTIVITY: ALL

050B

8G

71-00-00
Page 530
May 15/90



RB.211 Propulsion System

MAINTENANCE

13. Test No.12 - Anti-ice System Test

- A. Start engine (Ref. 71-00-00, Maintenance Practices, Para.9.).

Engine condition: No air offtake, I.D.G. disconnected or minimum load of 5 kilowatts.

- B. Run engine at ground idle for 5 minutes. This operation can be omitted providing 5 minute run at ground idle in starting engine has been accomplished.

- C. Press appropriate ENGINE ANTI-ICE switchlight (zone 210) and check that ON light comes on.

- D. Advance throttle lever slowly to achieve approximately 1.35 E.P.R. checking HEAT light comes on by approximately 75% N3. After achieving 1.35 E.P.R. immediately close throttle lever slowly to ground idle.

NOTE: If HEAT light does not come on or if HIGH PRESSURE light comes on, refer to Fault Isolation.

- E. Press ENGINE ANTI-ICE switchlight and check ON and HEAT lights go off.

- F. Run engine at ground idle for 5 minutes.

- G. Stop engine (Ref. 71-00-00, Maintenance Practices, Para.11A). The 5 minute run called for under 71-00-00, Maintenance Practices can be omitted providing operation F. has been accomplished.

- H. If I.D.G. disconnected prior to run, reconnect I.D.G.

R
R

EFFECTIVITY: ALL

050B

8G

71-00-00

Page 531
May 15/90



RB.211 Propulsion System

MAINTENANCE

14. Test No.13 - Thrust Reverser Test

Test may be effected with engine running as detailed below or using A.P.U. as detailed in 78-30-00, Adjustment/Test.

A. Engine Running

CAUTION: ENGINE MUST NOT BE OPERATED ABOVE REVERSE IDLE IN REVERSE THRUST

- (1) Start engine (Ref. 71-00-00, Maintenance Practices, Para.9.).
- (2) Run engine at ground idle for 5 minutes. This operation can be omitted providing 5 minute run at ground idle in starting engine has been accomplished.
- (3) Select reverse thrust on reverse thrust lever and check:
REVERSER OPERATING light - On
REVERSER IN TRANSIT light - On
- (4) When thrust reverser reaches full reverse position, check:
REVERSER IN TRANSIT light - Out
REVERSER OPERATING light - On
- (5) Select forward thrust on reverse thrust lever and check:
REVERSER IN TRANSIT light - On
REVERSER OPERATING light - On
- (6) When thrust reverser reaches full forward position, check.
REVERSER IN TRANSIT light - Out
REVERSER OPERATING light - Out
- (7) Run engine at ground idle for 5 minutes.
- (8) Stop engine (Ref. 71-00-00, Maintenance Practices, Para.11A.). The 5 minute run called for under 71-00-00, Maintenance Practices can be omitted providing operation (7) has been accomplished.

R EFFECTIVITY: ALL

050B

8G

71-00-00

Page 532
May 15/90



RB.211 Propulsion System

MAINTENANCE

C 15. Test No.14 - Fuel Flow Regulator Throttle Angle/E.P.R. Test

R
R
R

This test is to enable the incorporation of S.B.72-8700 when using a currently installed FFR type 101 Mk10 or F.F.R. 101 Mk11. This test will also enable the thrust/throttle angle relationship to be checked/set.

The Fuel Flow Regulator air throttle lever is set to a predetermined angle of 86.6 degrees and engine power checked and set to specified E.P.R. limits/forward thrust lever relationship.

Service Bulletins referred to:

S.B.72-8700 Increased flat rating of the RB211-22B-02 engine from
ISA + 13.9 deg.C. to ISA + 8.4 deg.C.

A. Equipment required:

Rolls-Royce UT1122 Spacer
or
Locally manufactured spacer

B. Open left hand hinged cowl 413A or 423A for engines No.1 and 3
(Ref 71-11-00 Servicing) or 433AL for engine No.2
(Ref 71-12-01 Servicing).

C. CAUTION: EXISTING SHIM(S) MUST NOT BE REMOVED FROM FORWARD
THRUST STOP.

Refer to fig.501, slacken forward thrust stop, fit UT1122
spacer under head of stop, retighten stop.

NOTE: Fitting UT1122 spacer 0.111in., (2,82 mm. thick) under
forward thrust stop limits the air throttle lever angle
to 86.6 degrees.

D. Close left hand hinged cowl 413A or 423A for engines No.1
and 3 (Ref 71-11-00, Servicing) or 433AL for engine No.2 (Ref
71-12-01, Servicing).

E. Obtain and record pressure altitude (millibars).

F. Start engine (Ref 71-00-00, Maintenance Practices).
Engine condition: No air offtakes.

G. Run engine at ground idle for minimum of 5 minutes. This
operation can be omitted provided the 5 minute run at ground
idle has been accomplished when starting engine.

EFFECTIVITY: ALL

0509

8G

71-00-00

Page 533
Mar 15/91



RB.211 Propulsion System

MAINTENANCE

- H. **CAUTION:** ENSURE ENGINE LIMITATIONS ARE NOT EXCEEDED (REF 71-00-00 MAINTENANCE PRACTICES).

Advance throttle lever to maximum forward throttle stop, allow engine to stabilise for 2 minutes, record indicated E.P.R.

- J. Close throttle lever to idle and run engine at ground idle for 5 minutes.

- K. Stop engine (Ref 71-00-00 Maintenance Practices) the 5 minute run called for when stopping engine can be omitted provided the 5 minute run specified in previous operation has been accomplished.

- L. Engines without S.B.72-8700 refer to Fig.502 (Sheet 1), engines with S.B.72-8700 refer to Fig.502 (Sheet 2), enter graph at 86.6 degrees at previously recorded pressure altitude and determine throttle angle correction factor.

- M. Apply correction factor obtained at 86.6 degrees to obtain the corrected throttle angle.

- N. Engines without S.B.72-8700 refer to Fig.502 (Sheet 1), engines with S.B.72-8700 refer to Fig.502 (Sheet 2), plot corrected throttle angle against previously recorded E.P.R. If plot falls outside limits:

(1) Adjust maximum power adjuster as detailed under Propulsion System Adjustments (Ref 71-00-00 Adjustment/Test).

(2) Repeat test procedure from para.13.E. to confirm correct adjustment.

- P. Open left hand hinged cowl 413A or 423A for engines No.1 or 3 (Ref 71-11-00, Servicing) or 433AL for engine No.2 (Ref 71-12-01, Servicing).

- Q. **CAUTION:** ENSURE EXISTING SHIM(S) ARE NOT REMOVED FROM STOP.

Refer to fig.501 slacken forward thrust stop and remove spacer UT1122 and retighten stop.

- R. Close left hand hinged cowl 413A or 423A for engines 1 or 3 (Ref 71-11-00, Servicing) or 433AL for engine No.2 (Ref 71-12-01, Servicing).

R EFFECTIVITY: ALL

050B

71-00-00

Page 534
Dec 15/91

8G



RB.211 Propulsion System

MAINTENANCE

CR 15A. Test No.14A - Fuel Flow Regulator Throttle Angle/E.P.R. Alternate Test

CR NOTE: This test may be utilized in lieu of regular test No.14
CR (Rolls-Royce procedure).

CR This test checks thrust lever alignment and thrust lever
CR angle/E.P.R.

CR The intent of this test is to check all 3 engines in the event of
CR thrust lever alignment problems. When an engine is changed or
CR dropped, only accomplish on that specific engine unless there are
CR thrust lever alignment problems. On F.F.R. replacement accomplish
CR only on the engine with the F.F.R. change, time and manpower
CR permitting. If not accomplished check will be scheduled at a
CR later time.

CR Check thrust lever arm at F.F.R. Insure it contacts min. and
CR max. stop. Perform RIG check - re RIG as necessary. Reference MM
CR 75-11-00, page 501.

CR Record temperature with accurate thermometer at engine nose cowl.

CR Position First Officer's altimeter to zero altitude and record
CR pressure in millibars.

CR Refer to Fig.502. Enter graph at 86.6 degrees actual F.F.R.
CR throttle lever angle line. Move vertically to recorded pressure
CR in millibars. Move horizontally left and record correction to
CR apply to actual angle. Apply this correction to 86.6 degrees
CR which will become the corrected throttle lever angle.

CR Refer to Fig.502. Using corrected throttle lever angle value
CR obtained, then enter left side of graph at this value. Proceed
CR right to the middle of the two diagonal lines. Move vertically
CR down and record the trimmed I.E.P.R. value.

CR Refer to Fig.501. Loosen forward thrust stop sufficiently
CR to fit TWA tool 73-1-01-0115 and retighten.

CR CAUTION: DO NOT REMOVE ANY EXISTING SHIMS.

CR Start engine using approved maintenance practices and operate with
CR no air offtakes.

CR Advance throttle lever to maximum throttle stop and allow engine
CR to stabilize for 2 minutes and record indicated E.P.R.

EFFECTIVITY: ALL

050B

86

71-00-00

Page 535
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

- CR CAUTION: MONITER ALL INSTRUMENTS AND ENSURE NO ENGINE LIMITATIONS
CR ARE EXCEEDED.
- CR Reduce engine to idle and compare indicated E.P.R. to the trimmed
CR I.E.P.R. value.
- CR Adjust max. adjuster; rerun engine and ensure trimmed I.E.P.R.
CR value recorded is obtained.
- CR NOTE: Turn max. adjuster clockwise to decrease E.P.R.;
CR counterclockwise to increase E.P.R. One complete turn
CR alters E.P.R. by 0.008 at take-off power.
- CR NOTE: If trimmed I.E.P.R. value cannot be achieved, F.F.R.
CR must be replaced and/or corrections to fuel system
CR accomplished and test 14 accomplished.
- CR After obtaining trimmed I.E.P.R. value, reduce engine to idle
CR and shut down using approved MM procedure.
- CR Refer to Fig.501. Loosen forward thrust stop sufficiently to
CR remove TWA tool 73-1-01-0115. Retighten thrust stop.
- CR Check area after completion; close and latch cowling.
- CR Staticly advance T/L and insure forward stop is contacted
CR insuring full travel.

EFFECTIVITY: ALL

050B

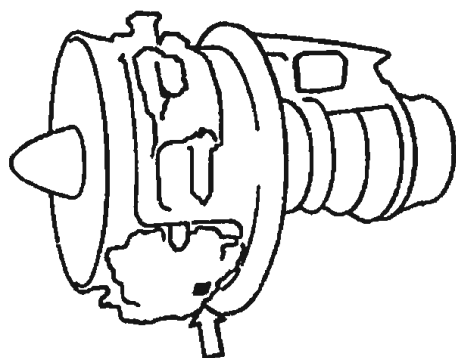
8G

71-00-00
Page 536
Dec 15/91

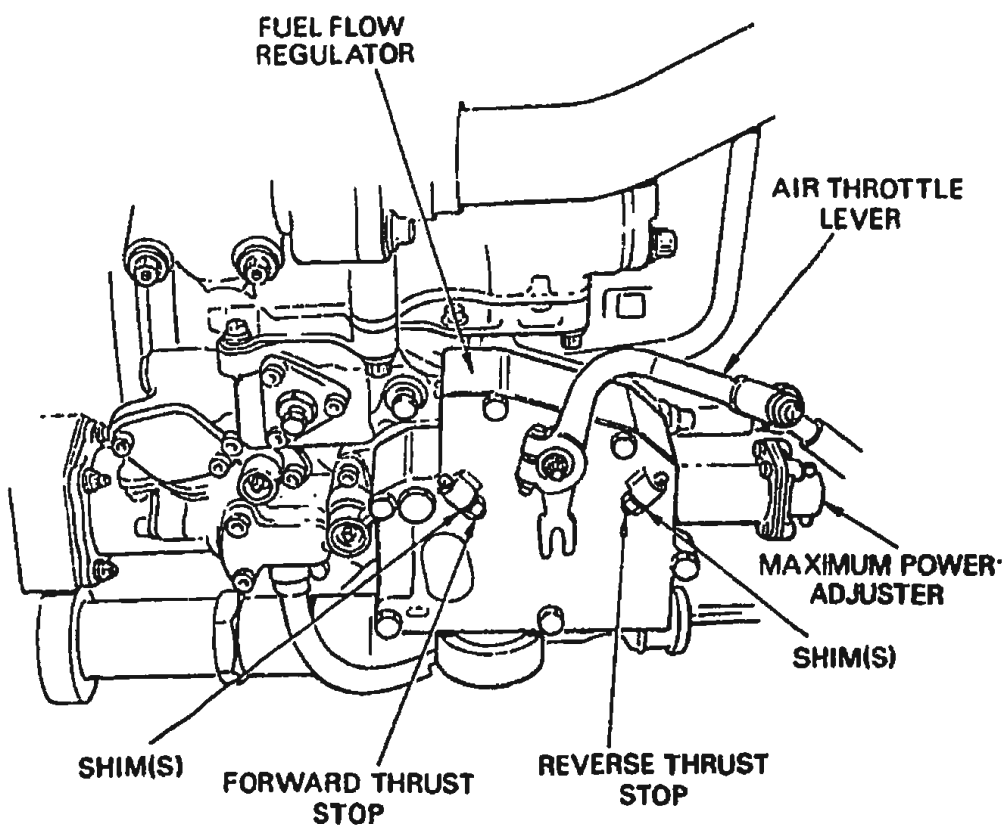


RB.211 Propulsion System

MAINTENANCE



← FORWARD



99724A

CR
CR

Fuel Flow Regulator forward thrust stop
Fig.501

EFFECTIVITY: ALL

050B

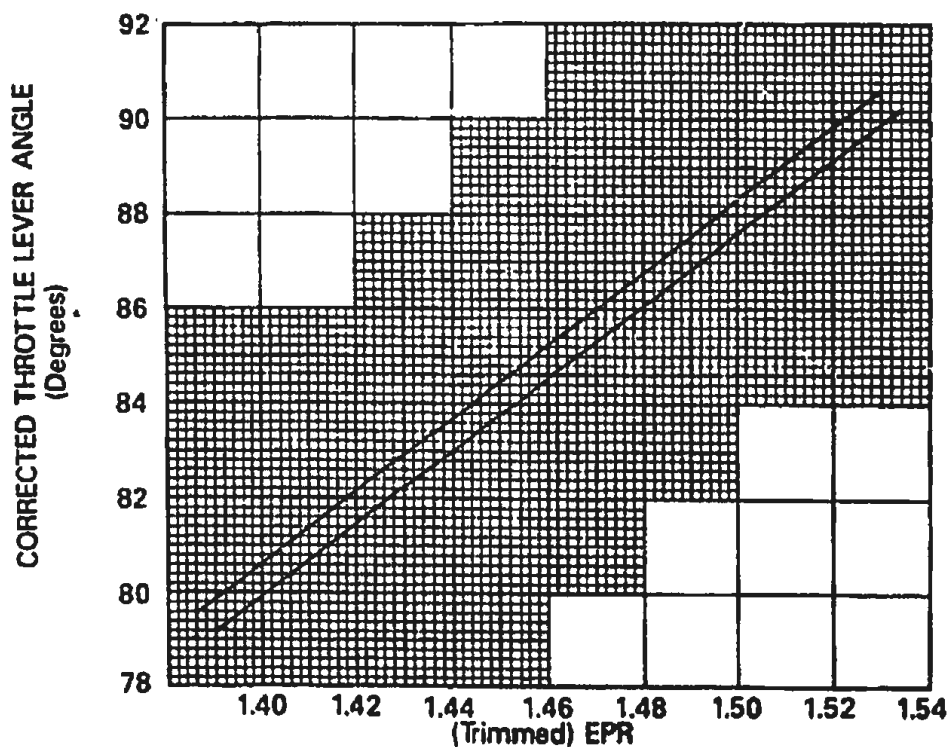
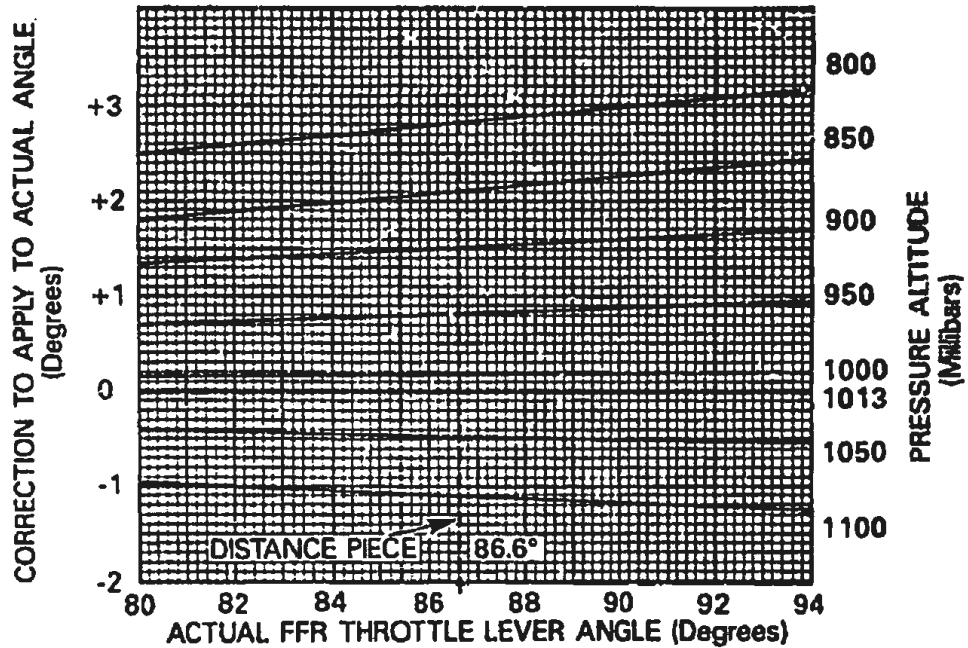
8G

71-00-00
Page 537
Dec 15/91



RB.211 Propulsion System

MAINTENANCE



A7312A

R
R

Throttle angle/E.P.R. Test limits engines without S.B.72-8700
Fig.502 (Sheet 1)

EFFECTIVITY: ALL

050B

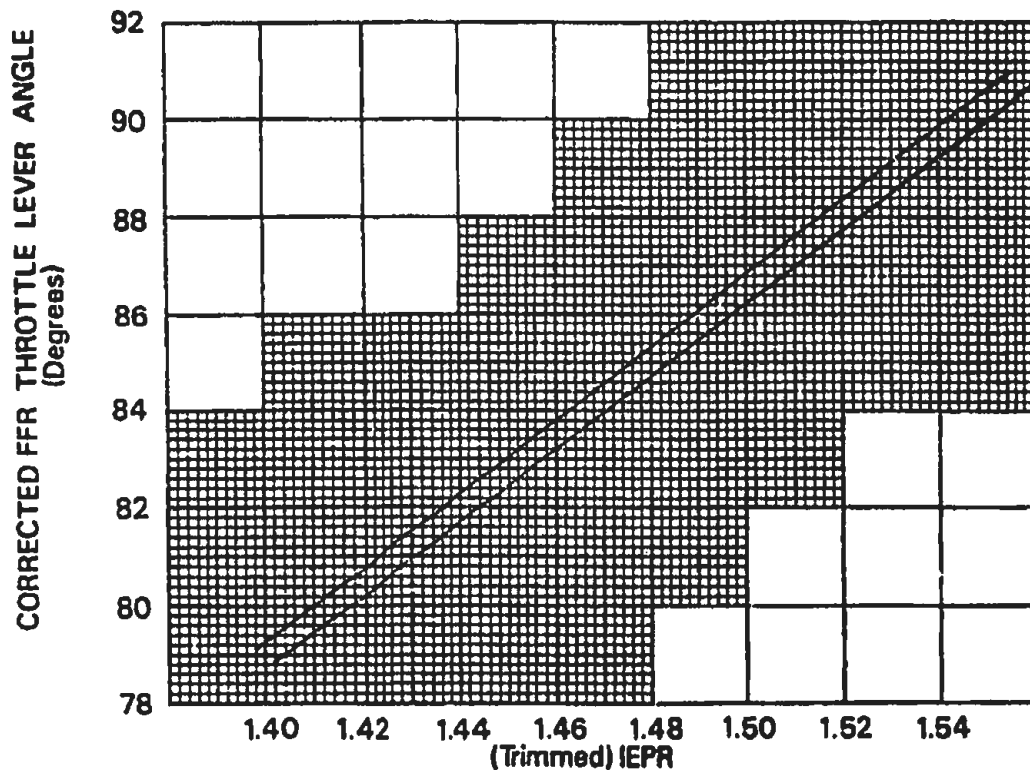
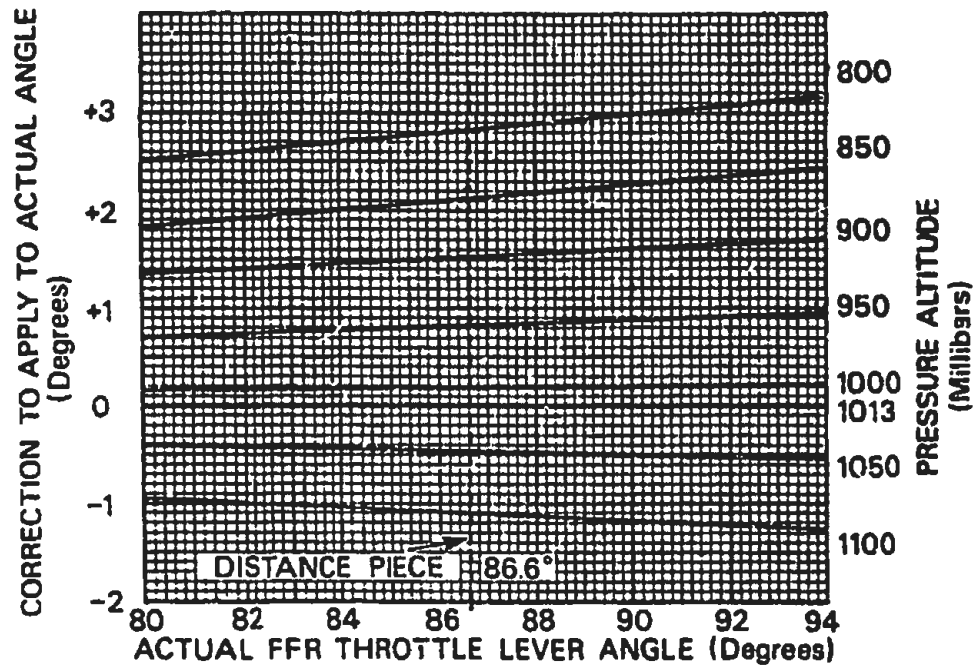
8G

71-00-00
Page 538
Jun 15/93



RB.211 Propulsion System

MAINTENANCE



99725B

R
R

Throttle angle/E.P.R. test limits engines with S.B.72-8700
Fig.502 (Sheet 2)

EFFECTIVITY: ALL

0508

8G

71-00-00
Page 539
Jun 15/93



RB.211 Propulsion System

MAINTENANCE

. C 16. Test No.16 - L.P. Compressor Rotor Trim Balancing

C The following is the recommended TWA trim balancing procedure:

C NOTE: Also reference Test No.16A (trim balancing procedure using
C the PBS-4000

C CAUTION: THE MAXIMUM WEIGHT THAT MAY BE FITTED TO THE THRUST
C RING BALANCING FLANGE IS 9.0 OZ. (255.15 GM.).
C THIS CORRESPONDS TO FOUR SINGLE BOLT BALANCING PLATES
C AND ATTACHING BOLTS AND NUTS.

C A. Equipment Required

C Single bolt balancing plate - (Plate weighs nominally 2oz.)
C stock item (Nut and bolt weigh nominally
C .25 oz.)

C Two bolt balancing plate - (Plate weighs nominally 4 oz.)
C stock item (Nuts and bolts weigh
C nominally 0.50 oz.)

C B. Pre-Balance Run Up

C (1) Start engine (Ref.71-00-00, Maintenance Practices).

C (2) Run engine at ground idle for five minutes. This
C operation can be omitted provided five-minute run at
C ground idle in starting engine has been accomplished.

C (3) On ENGINE STATUS PANEL, Zone 215, press 'A' switchlight
C on and turn rotary switch to NORMAL.

C (4) Slowly advance thrust lever from idle to takeoff EPR
C (See chart for takeoff EPR 71-00-00, Fig.514, Sheet 1).

C (5) Note EPR when AVM reaches highest level. Retard
C thrust lever to the noted EPR. Record EPR on trim
C balance work sheet at pre AVM run up and post AVM
C run up squares. Record AVM level for 'A' normal
C (See Fig.503).

C (6) On engine status panel, Zone 215, turn rotary switch
C to low position; record AVM level. Select 'B'
C switchlight on, 'A' light off, rotary to normal; record
C AVM level. Rotary switch to low; record AVM level.



RB.211 Propulsion System

MAINTENANCE

- C (7) Adjust thrust lever to achieve N1 speed of 90 percent;
C hold for one minute. Record AVM levels for 'A'
C Normal/Low, 'B' Normal/Low (See Fig.503).
- C (8) Close throttle lever to ground idle position and run
C engine for five minutes.
- C (9) Stop engine (Ref.71-00-00, Maintenance Practices).
- C (10) Refer to fig.503 if difference between 'A' Low and
CR 'B' Low is greater than 0.2 units, do not trim balance.
C AVM indication system should be checked out.
- C (11) If ~~AVM~~ readings for 'A' Low and 'B' Low are .6 or
C less, no further action is necessary.

C. Trim balance L.P. Compressor

C NOTE: If, during any of the following three engine runs
C the vibration indicator readings reduce below .6
C units, the balancing plate may be left in that
C position without completing the remainder of the
C procedure.

- C (1) Remove L.P. compressor spinner and anti-icing tubes
C (Ref. 72-31-03, Maintenance Practices).
- C (2) Position a one-hole trial balance weight at rear of
C any hole and secure with nut and bolt ensuring weight
C is pushed radially outward during assembly to ensure
C a good fit on thrust ring balancing flange. Using
C a dye marker, indicate this hole at position 1.

C NOTE: If weights are already installed, place the
C trial weight so that it can be moved to holes
C No.9 and 18 without interfering with existing
C weights (Ref.71-00-00, Fig.504).

- C (3) Mark position of existing balance weights on data
C sheet (Ref.71-00-00, Fig.505).
- C (4) Start engine (Ref.71-00-00, Maintenance Practices).
- C (5) Run engine at ground idle for five minutes.

EFFECTIVITY: ALL



RB.211 Propulsion System

MAINTENANCE

Position	N1/EPR	A Normal	A Low	B Normal	B Low
Pre AVM Runup					
	90%				
Pos. 1	90%				
Pos. 2	90%				
Pos. 3	90%				
Post AVM Runup					
	90%				

65338

Trim Balance Data Sheet Fig.503

C
C

R EFFECTIVITY: ALL

R
050B

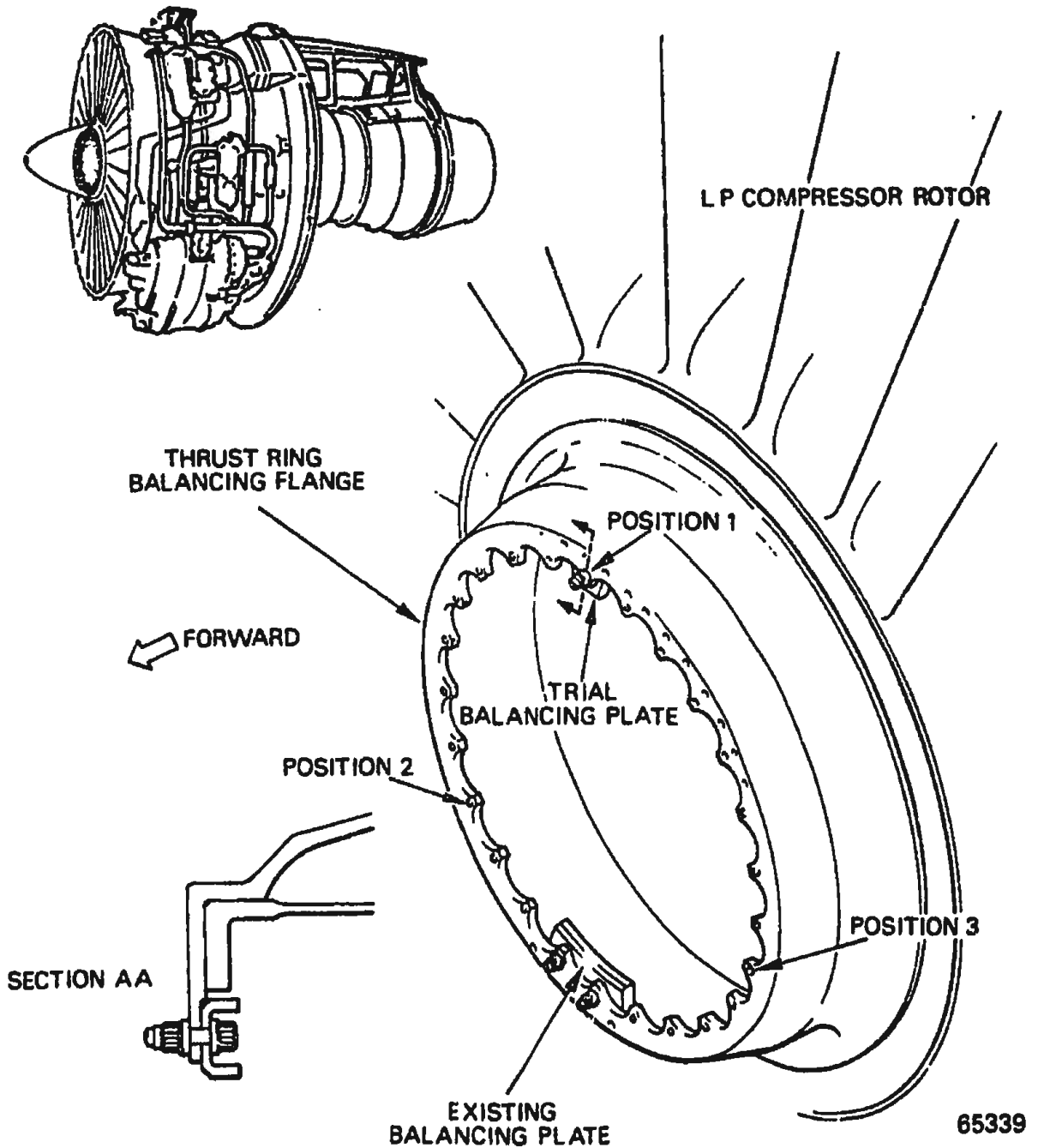
8G

71-00-00
Page 542
Dec 15/91



RB.211 Propulsion System

MAINTENANCE



View on Thrust Ring
Fig.504

C
C

R EFFECTIVITY: ALL

R
050B

8G

71-00-00
Page 543
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

- C (6) Advance thrust lever to 90 percent N1 for one minute.
C Observe AVM levels on 'A' Low and 'B' Low positions.
C Record units in space on trim balance data sheet
C (Fig.503).
- C (7) Reduce thrust lever to idle and run engine at ground
C idle for five minutes. Shut down.
- C (8) Remove trial weight and reinstall in hole 9. This
C is position 2.
- C (9) Repeat Steps (4), (5), (6), and (7).
- C (10) Remove trial weight and install in hole 18. This is
C position 3.
- C (11) Repeat (4), (5), (6), and (7).
- C D. Plotting Location for Final Balance Weight (Ref.71-00-00,
C Fig.505)
 - C (1) Using information from the Trim Balance Data Sheet
C (Fig.503), average the 'A' and 'B' readings for
C position 1. Erect a perpendicular line from the
C center of Fig.505, which length is equal to the
C units recorded for position 1. Call this point 'X'.
 - C (2) Using information from the Trim Balance Data Sheet
C (Fig.503), average the 'A' and 'B' readings for
C position 2. From point 'X', erect a line down the
C 120 degree diagonal line to the left equal to the
C units recorded for position 2. Call this point 'Y'.
 - C (3) Using information from the Trim Balance Data Sheet
C (Fig.503), average the 'A' and 'B' readings for
C position 3. From point Y, erect a line down the
C 120-degree diagonal line to the right equal to the
C units recorded for position 3. Call this point 'Z'.
 - C (4) From point 'Z', erect a Vector through the center
C continuing on across to the opposite side of hub.
C At the point where this Vector intersects the closest
C bolt hole, mark the position for the final weight.



RB.211 Propulsion System

MAINTENANCE

- E. Remove trial weight which was installed in hole 18, Step C. (10). Position a one-hole weight at rear of hole marked in Step D. (4) and secure with nut and bolt ensuring weight is pushed radially outward during assembly to ensure a good fit on thrust ring. Paint this weight red so it may later be identified as a field trim balance.
- F. Inspect area inside of spinner for extraneous material. Install anti-ice tube and spinner cap and secure with bolts.
- G. Post trim run up check
- (1) Start engine (Ref.71-00-00, Maintenance Practices).
 - (2) Run engine at ground idle for five minutes.
 - (3) On ENGINE STATUS PANEL, Zone 215, press 'A' switchlight ON and turn rotary switchlight to LOW.
 - (4) Run engine at 90 percent N1 for one minute. Record the following on trim balance data sheet:
 - (a) AVM 'A' system; low position.
 - (b) AVM 'B' system; normal position.
 - (c) AVM 'A' system; normal position.
 - (d) AVM 'B' system; low position.
 - (5) Run engine at EPR which produced highest AVM in Step B.(5). Record the following on trim balance data sheet :
 - (a) AVM 'A' system; low position.
 - (b) AVM 'B' system; normal position.
 - (c) AVM 'A' system; normal position.
 - (d) AVM 'B' system; low position.
 - (6) Close thrust lever to ground idle position and run engine for five minutes.
 - (7) Stop engine (Ref.71-00-00, Maintenance Practices).

R EFFECTIVITY: ALL

050B

86

71-00-00

Page 545
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

- C (8) If AVM in low position has not been reduced to .6 or
C below, remove one-hole trial balance weight and replace
C with a two-hole weight (This .6 limit applies to No.2
C engine only).
- C (9) Rerun engine and recheck as in Steps (4) and (5).

R
R
050B

EFFECTIVITY: ALL

8G

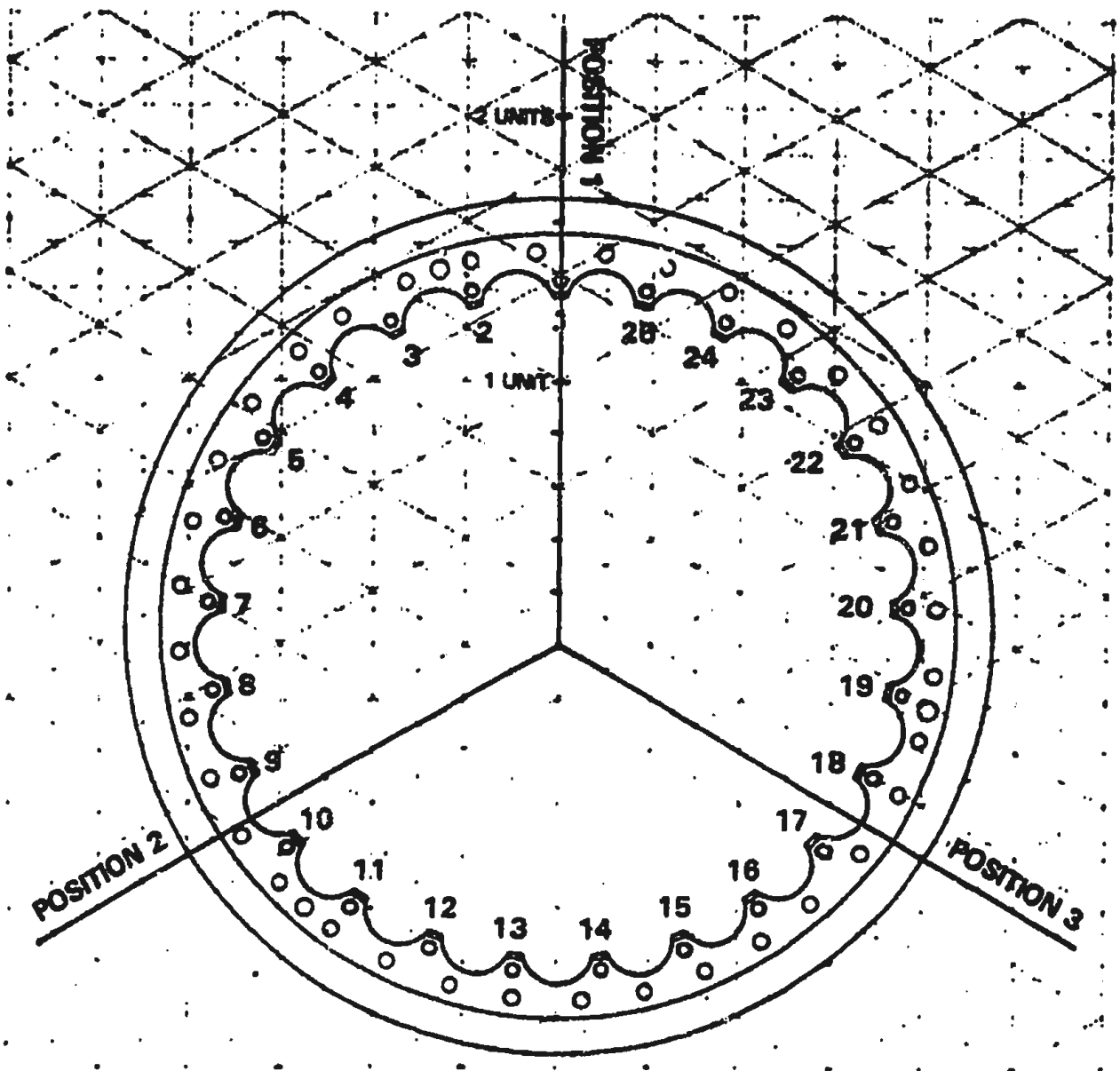
71-00-00

Page 546
Dec 15/91



RB.211 Propulsion System

MAINTENANCE



SCALE: 0 1 2
UNITS

AS VIEWED FROM FRONT LOOKING AFT

Position 1 Hole 1
Position 2 Hole 9
Position 3 Hole 18

65340

C

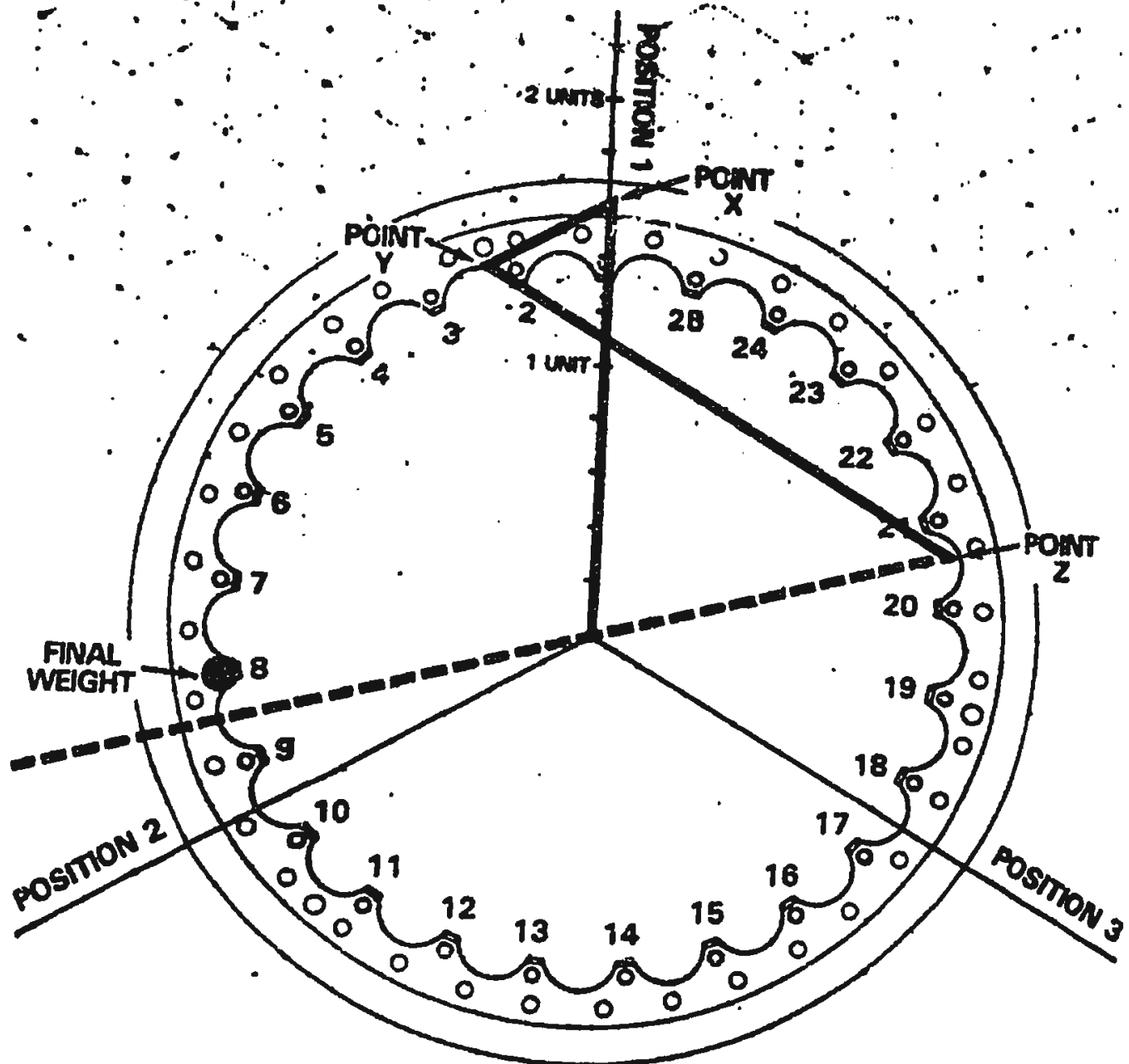
Fig.505

R
R
050B

EFFECTIVITY: ALL

8G

71-00-00
Page 547
Dec 15/91



SCALE: 0 1 2
UNITS

AS VIEWED FROM FRONT LOOKING AFT

65342

Typical Trim Balance Plot
Fig.506



RB.211 Propulsion System

MAINTENANCE

16A. Test No. 16A - L.P. Compressor Rotor Trim Balancing Using the PBS-4000 Portable Balancing System

NOTE: In order to improve the technique of L.P. Compressor trim balancing over that currently instructed in the Maintenance Manual, the PBS-4000 Portable Balancing System may be used.

A. General

The PBS-4000 consists of a powerful computer, a built-in CRT display, disk drive, mass storage, and signal interface and data acquisition circuits, all contained in a single, portable unit.

The PBS-4000 consists of the host processor, a built-in CRT display, a floppy disk drive, mass storage boards, internal data acquisition circuits, and an optional printer. Except for the printer, the entire system is contained in a single portable unit. The PBS-4000 is designed around a Compaq computer, a rugged and proven design. MTI has made extensive modification to the base processor to produce the PBS-4000 system. Multichannel printed circuit boards are contained within the PBS-4000 chassis. These circuits provide programmable gain, filtering, and sampling functions for data acquisition. The engine speed signal can be connected to an optional tachometer signal conditioner, also mounted within the chassis. This conditioner provides auto-scaling and buffering circuits for the speed signals, and also provides automatic discrimination of a long or short tooth on the engines' tach-generator wheel, for those engines so equipped. Signal integration is implemented in software and is selectable by the operator. The PBS-4000 is supplied with a 115/230 Vac. 50/60/400 Hz power supply to allow use at remote maintenance facilities or on aircraft.

R EFFECTIVITY: ALL

050B

71-00-00

Page 549
Dec 15/91

8G



RB.211 Propulsion System

MAINTENANCE

B. PBS-4000 Computer Instructions

NOTE: The following are condensed instructions on the use of the PBS-4000 trim balance computer. Complete instructions can be found in PBS-4000 Manual, Volume 2, Page 3-2.

- (1) The Power cord plugs in on the left side of the computer towards the rear. You may have to slide open a plastic cover where the cord is stored. See Fig.509. When you press the keys, hit them with your fingertips. Do not slowly press them or you will get a repeat of the key and a possible error.

The ENTER key is the key to the left of the HOME key. See Fig.508.

The SHIFT key is the hollow arrow pointing up. See Fig.508.

The PRINT SCREEN (PrtSc) key is a shifted (upper case) *.

The screen brightness control is to the left of the screen. See Fig.507.

Plug in the TACH signal (optical or shaved tooth) into the TACH IN on the front panel of the computer. See Fig.510.

Plug the VIBRATION signal into the VIBRATION IN on the front panel of the computer. See Fig.510.

N/REV is used for the shaved tooth. See Fig.510.

I/REV is used for the optical tach. See Fig.510.

(2) Floppy Diskettes

Insert floppies with the notch down, label facing left and the oval hole gets inserted first. See Fig.513. Always be gentle with floppies. Do not write on them, bend or touch the exposed disk.



RB.211 Propulsion System

MAINTENANCE

- . C (3) Printer
- C The printer plugs in the right side of the computer. See
C Fig.511. The printer is battery powered and will also
C run with charger attached. The power switch on the
C printer is in the right rear. The DIP switches on the
C printer should be set 01100110 (0=down, 1=up).
- C (4) Optical Tach
- C When using the optical tach, be sure that the ni-cad
C batteries are charged up. A gain setting of 9 on the
C optical tach box works well. If you read too high an
C RPM reduce the gain and if you read too low an RPM
C increase the gain slightly. BE CAREFUL WITH THE OPTICAL
C CABLE PLEASE.
- C (5) Shaved Tooth Tach Signal
- C When using the shaved tooth for a Tach signal tap the
C signal off of the N1 indicator in the cockpit. Unscrew
C the N1 indicator from the panel in the cockpit and
C disconnect the cannon plug from the indicator. Carefully
C connect to pins 3 and 12 (Ref.77-12-03 Sheet 1 of 2
C page 1).
- C (6) Vibration Signal
- C The vibration signal is tapped off at the vibration
C amplifier located behind the lower level gally. (QEC
C must be selected in test cell No.3). Connect to pins
C 1 and 8 of the engine being balanced. Route the cable
C up the elevator, pull the breaker on the elevator and
C run the cable down the isle off to one side to avoid a
C tripping hazard.
- C (7) Marking the No.1 Balance Hole
- C The No.1 hole should be across from the blade with the
C optical reflective tape OR lined up with the shaved
C tooth. The hole numbering is clockwise from 1-25.

B.211 Propulsion System MAINTENANCE

C. Computerized Trim Balance Procedure

NOTE: If the power is lost to the computer in the middle of a balance run, it is possible to begin again where you left off (Step 26). Never choose F6 (ABORT) unless you are willing to loose all of your data on the Run In Progress.

(1) Turn on the computer (left rear).

(2) Enter date, press ENTER (e.g. 6/17/89) use slashes between numbers.

(3) Enter time, press ENTER (e.g. 9:11 or 21:11 use colon between hours and minutes).

NOTE: Colon ":" is achieved by upper case semi-colon (SHIFT/;)

(4) Insert ENGINE DATA DISKETTE (notch down, label left) and move lever on disk drive to horizontal position.

(5) Press F1 (continue).

(6) Press F1 (continue).

(7) Press 1 and ENTER (define new engine identification).

(8) Press F2 (add new ID).

(9) Select an unused number (1-20) and press ENTER.

(10) Type in the Engine Serial Number and press ENTER.

(11) Select the choice you plan to balance and press ENTER.

NOTE: Entering a new serial number does not select the one you plan to use. After entering a new number you must follow by selecting the choice you plan to use.

(12) Press F1 (main menu).

(13) Press 2 and ENTER (perform vibration survey).

(14) Select 1 and press ENTER (or select the survey of your choice).



RB.211 Propulsion System

MAINTENANCE

- . C (15) Bring engine to idle.
- C (16) Confirm that you are getting both signals.
- C (17) Press F1 (start survey) when you are ready to begin acceleration..
- C (18) Advance the throttle slowly until you reach desired RPM, (90% or T/O).
- C (19) Press F1 (survey complete) when you reach desired RPM, (90% or T/O).
- C (20) Do not throttle back yet, you will soon get balance data at step 23 below, continue to next step now.
- C You will now see the Plot of the vibration.
- C (21) Press F4 to print out the Plot for later use.
- C NOTE: The solid line in ONLY N1 vibration, the dotted line is ALL vibration including N1. Therefore, if the solid line is at a very low level, you will not be able to balance the rotor. Conversely, if the solid line is very close to the dotted line you will be able to balance the rotor.
- C (22) Press F1 (continue).
- C (23) Press F1 (save data).
- C (24) Press F1 (main menu).
- C (25) Select 3 and press ENTER (balance engine).
- C (26) Select 1 and press ENTER (trial weight balancing).
- C NOTE: You may choose STORED INFLUENCE COEFFICIENT BALANCING if you are sure there is sufficient Influence Coefficient data for the computer to use. (There should be about 3 data entries prior to using). After selecting choice 2, then select the IC set you plan to use (1-10) and press ENTER. It is also possible to CONTINUE LAST RUN if the power was interrupted.

R EFFECTIVITY: ALL

050B

8G

71-00-00
Page 553
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

- C (27) Run engine to desired RPM, (90% or T/O) and allow the
C turbine to stabilize for at least 5 minutes.
- C NOTE: Stable data can be recognized when the Phase Angle
C and Vibration Level does not change very much.
- C (28) Confirm that you are getting both signals.
- C (29) Press F1 (get uncorrected data). Once the turbine is
C stabilized.
- C (30) Press F1 (accept data).
- C (31) Press F3 (install trial weight).
- C (32) Press F1 (continue).
- C (33) Answer the question on the screen and press ENTER (how
C many trial weights are going to be installed?). The
C answer is usually 1. Use -1 if you plan to remove a
C weight for a trial weight.
- C NOTE: Do not confuse TRIAL WEIGHTS you plan to install
C with EXISTING WEIGHTS.
- C (34) Answer the question on the screen and press ENTER (what
C weight class?). The answer will be 1 (1 hole weight) or
C 2 (2 hole weight) or 3 (3 hole weight).
- C (35) Answer the question on the screen and press ENTER (what
C is the hole location).
- C NOTE: A multiple hole weight will be entered; 6,7 or
C 2,3,4.
- C (36) Press F1 if proposed weight is correct.
- C (37) Run engine to the exact baseline speed you took data at
C previously + 1% and allow the turbine to stabilize for
C at least 5 minutes (it will not accept any other speed).
- C (38) Confirm that you are getting both signals.
- C (39) Press F1 (get corrected data). Once the turbine is
C stabilized.
- C (40) Press F1 (accept data).



RB.211 Propulsion System

MAINTENANCE

- . C (41) Shut engine off.
- C (42) Press F3 (balance engine).
- C (43) Press F1 (continue).
- C (44) Press F1 (continue). (Print screen (Shift and PrtSc together) if so desired).
- C (45) Press F1 (balance weights). (Print screen (Shift and PrtSc together) if so desired).
- C (46) Answer the question on the screen and press ENTER (how many existing weights are installed that were there during the baseline run?).
- C NOTE: 1. Do not include your TRIAL WEIGHTS in this answer.
- C 2. If you removed a weight for your TRIAL WEIGHT you must include that removed weight in your answer. (e.g. 2 weights were present during your freq. survey and baseline run. You removed one weight for your trial weight run. When it asks "how many existing weights are installed?" you would say 2).
- C 3. If you had 2 weights and you added 2 weights for the trial run, your answer would still be 2 not 4.
- C 4. Do not confuse TRIAL WEIGHTS you plan to install with EXISTING WEIGHTS.
- C (47) Answer the question on the screen and press ENTER (what weight class?). The answer will be 1 (1 hole weight) or 2 (2 hole weight) or 3 (3 hole weight).
- C (48) Answer the question on the screen and press ENTER (what is the hole location).
- C NOTE: A multiple hole weight will be entered; 6,7 or 2,3,4.
- C (49) Press F1 (if the information is correct).
- C The computer will now show the weight and location desired (print if desired).
- C



RB.211 Propulsion System

MAINTENANCE

- C (50) Press F1 (balance weights).
- C (51) Print the screen by pressing Shift and PrtSc together.
- C (52) Press F1 (view balance plot).
- C (53) Press F4 (Print screen).
- C After printing the print-out can be used when installing
C the balance weights.
- C (54) Press F1 (continue).
- C (55) Press F4 (Do a check run).
- C (56) Press F1 (correct) if the weights installed are correct.
- C (57) Run engine to the exact baseline speed you took data at
C previously $\pm 1\%$ and allow the turbine to stabilize for
C at least 5 minutes (it will not accept any other speed).
- C (58) Confirm that you are getting both signals.
- C (59) Press F1 (get corrected data). Once the turbine is
C stabilized.
- C NOTE: If you get a message "DATA NOT STABLE", this
C means one of two things; either the data is
C fluctuating too much and you must choose F2
C (retake data) or it means that you have balanced
C the rotor correctly and the vibration level is so
C low that it is difficult to get stable data. If
C the vibration amplitude is very low then press F1
C (accept data).
- C (60) Press F1 (accept data).
- C (61) Shut engine off.
- C (62) Press F3 (rebalance the engine). If balance is
C acceptable, go to (76).
- C (63) Press F1 (continue).
- C (64) Press F1 (continue). (Print screen (Shift and PrtSc
C together) if so desired).
- C (65) Press F1 (balance weights). (Print screen (Shift and
C PrtSc together) if so desired).

 RB.211 Propulsion System
MAINTENANCE

- . C (66) Press F1 (view balance plot).
- C NOTE: If the computer recommends the same solution as
C the last time, or if it alternates between the
C same two solutions, this means that the rotor
C can not be balanced any better.
- C (67) Press F4 (print screen).
- C After printing the print-out can be used when installing
C the balance weights.
- C (68) Press F1 (continue).
- C (69) Press F4 (Do a check run).
- C (70) Press F1 (correct) if the weights installed are correct.
- C (71) Run engine to the exact baseline speed you took data at
C previously $\pm$ 1% and allow the turbine to stabilize for
C at least 5 minutes (it will not accept any other speed).
- C (72) Confirm that you are getting both signals.
- C (73) Press F1 (get corrected data). Once the turbine is
C stabilized.
- C (74) Press F1 (accept data).
- C (75) Shut engine off.
- C (76) If the vibration level is still too high then press F3
C (rebalance the engine) and return to step (63) and
C continue from there.
- C If the vibration level is acceptable press F2 (done).
- C (77) Press F1 (continue).
- C (78) Press F2 (print screen).
- C (79) Press F1 (continue).
- C (80) Press F1 (store Influence Coefficients).



RB.211 Propulsion System

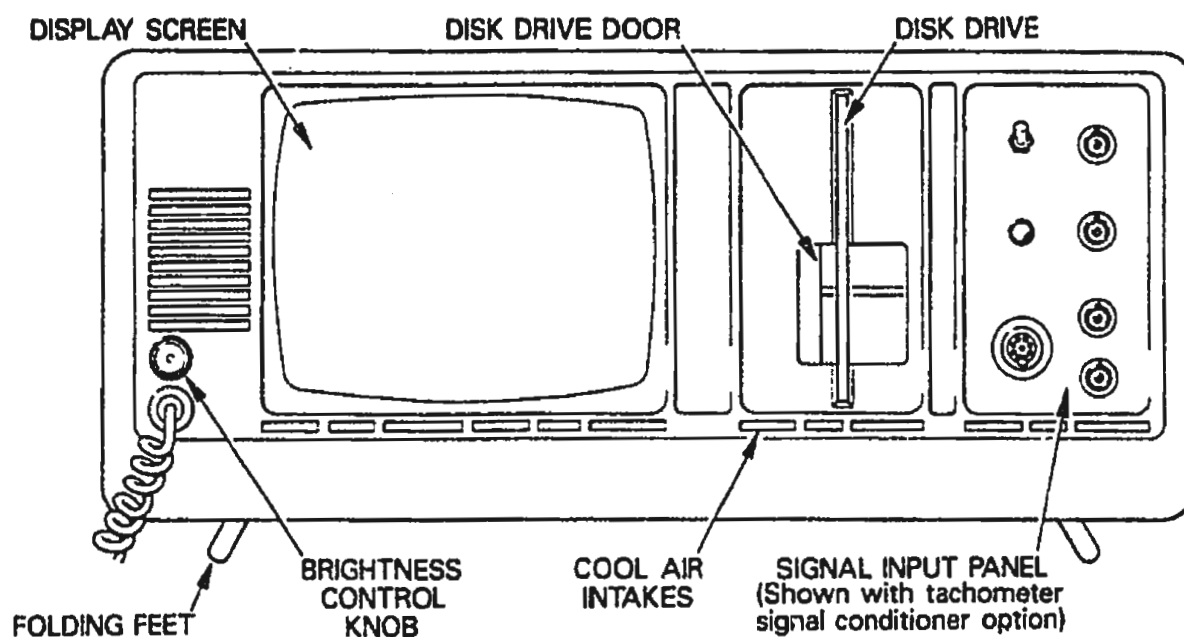
MAINTENANCE

- . C (81) Press F1 (continue).
- C NOTE: Be careful to store the influence coefficient
- C (IC) in the correct category. Choosing the wrong
- C category will "pollute" the existing IC. If unsure
- C select F2 (do not store).
- C (82) Select a number 1-10 and Press ENTER.
- C (83) Press F4 (store summary).
- C (84) Enter a comment such as engine number and date and press
- C ENTER.
- C (85) Press F3 (done).
- C (86) TURN OFF COMPUTER.



RB.211 Propulsion System

MAINTENANCE



A5679

The PBS-4000 System
Fig.507

C
C
R
R
050B

EFFECTIVITY: ALL

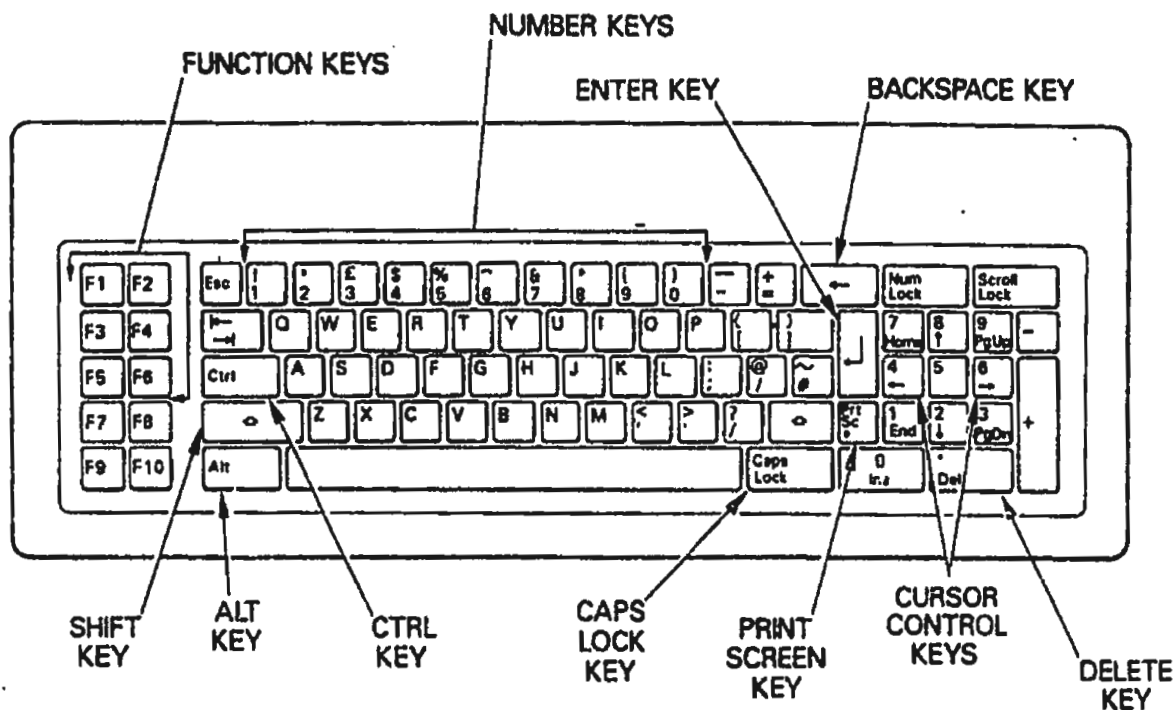
8G

71-00-00
Page 559
Dec 15/91



RB.211 Propulsion System

MAINTENANCE



A6680

The PBS-4000 System Keyboard
Fig.508

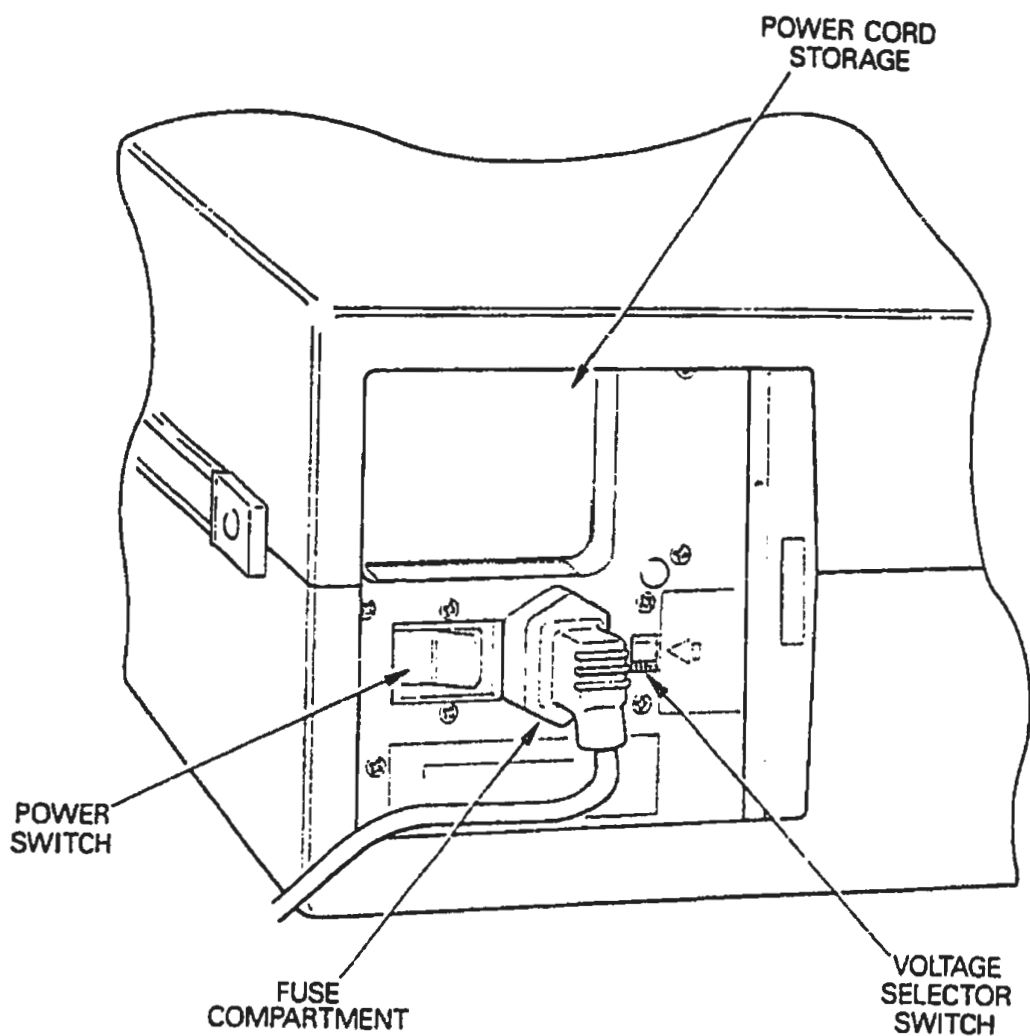
C
C
R
R
050B

EFFECTIVITY: ALL

8G

71-00-00
Page 560
Dec 15/91

ROLLS ROYCE RB.211 Propulsion System
MAINTENANCE



A6681

Power Storage Compartment
 Fig.509

C
 C
 R
 R
 050B

EFFECTIVITY: ALL

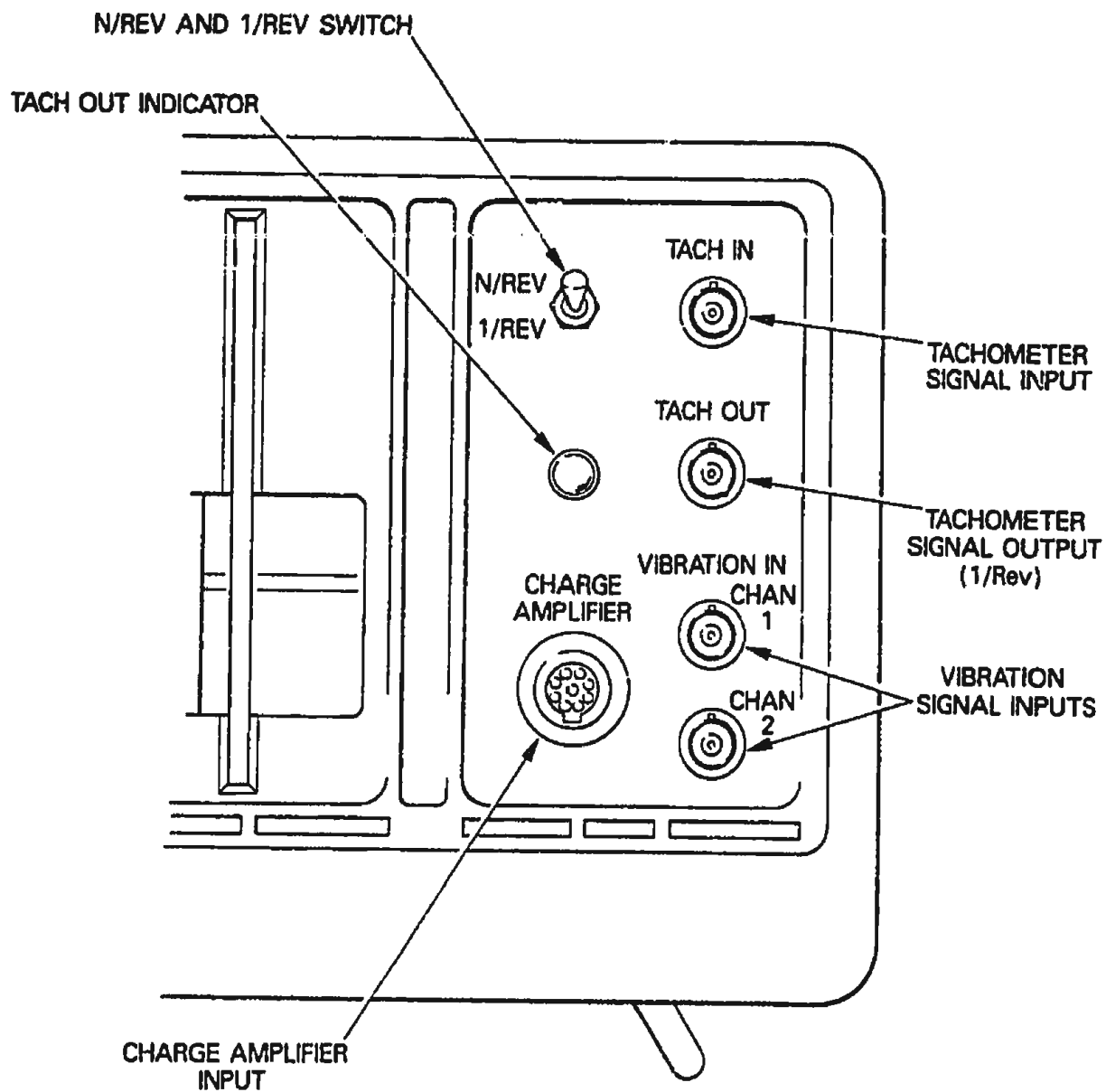
8G

71-00-00
 Page 561
 Dec 15/91



RB.211 Propulsion System

MAINTENANCE



A6682

C
C

Signal Input Panel with Tachometer Signal Conditioner Option
Fig. 510

R
R

EFFECTIVITY: ALL

0508

8G

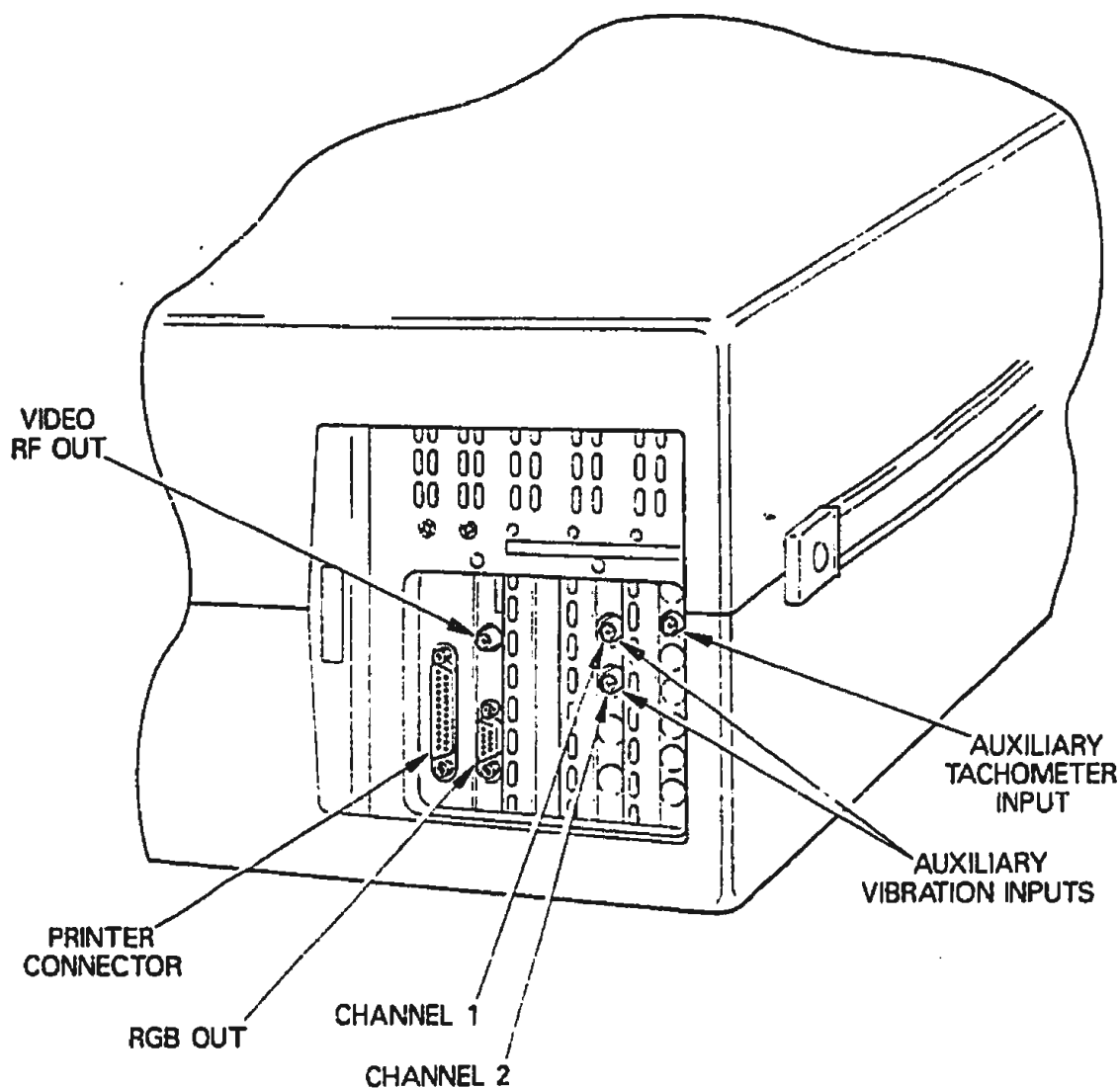
71-00-00

Page 562
Dec 15/91



RB.211 Propulsion System

MAINTENANCE



A6683

Auxiliary Connection Compartment
Fig.511

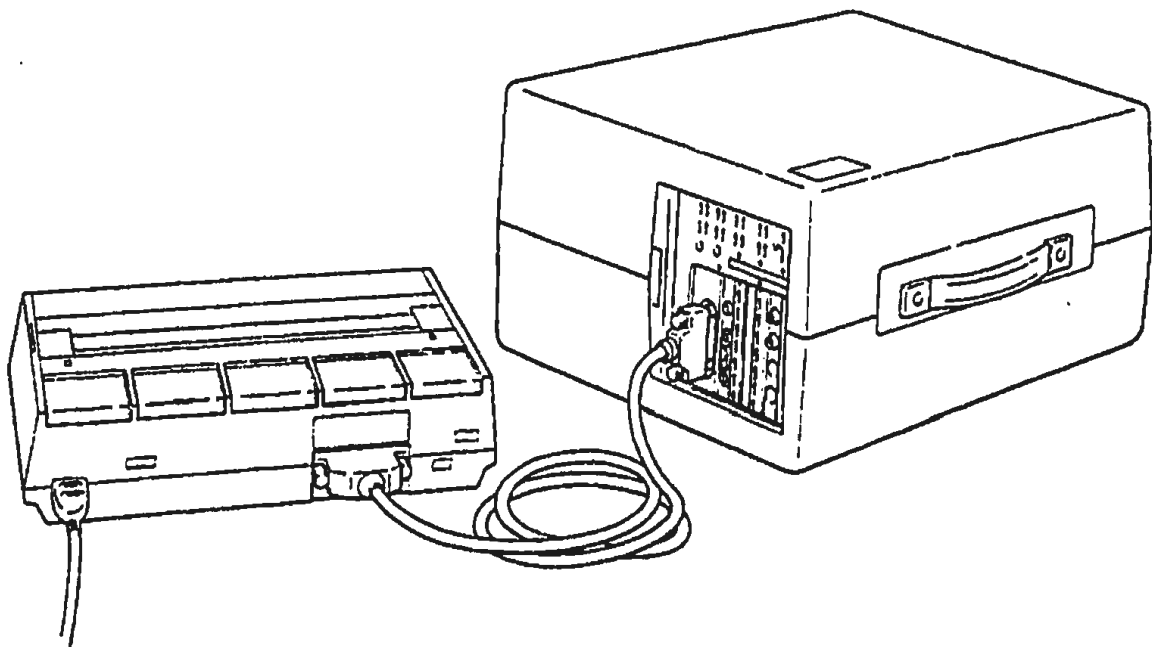
C
C
R
R
050B

EFFECTIVITY: ALL

8G

71-00-00
Page 563
Dec 15/91

BB.211 Propulsion System
MAINTENANCE



A6684

Printer Connection
Fig.512

C
C

R EFFECTIVITY: ALL
R
050B

71-00-00
Page 564
Dec 15/91

86



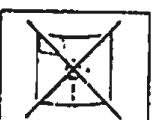
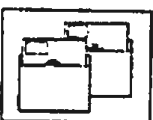
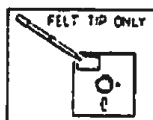
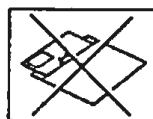
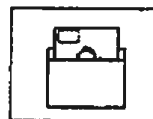
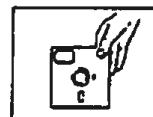
RB.211 Propulsion System

MAINTENANCE

CARE AND HANDLING: DISKETTES

With the basic PBS-4000 system, you will receive at least one engine data diskette, one diagnostic and calibration diskette, and one practice run diskette. Each diskette contains valuable system data and must be handled with care to prevent damage.

- 1 Handle a diskette properly. Grasp it with your thumb and forefinger, and never touch the actual recording surface.
- 2 Store diskettes upright in their paper covers in a cool, dry place. Any dirt/dust that enters a diskette or excessive heat/moisture can cause a loss of data or damage to the system
- 3 Never place a diskette flat on any surface as accidental placement of a heavy object on a diskette could damage the recording surface
- 4 Use a felt-tip marker to label a diskette. Ballpoint pens and pencils can damage the recording surface and result in permanent loss of data.
- 5 Keep diskettes away from magnetic fields.
- 6 If you spill any liquid on the diskette, discard it immediately. Do not try to clean it as residue on a diskette will damage the disk drive if ever inserted.
- 7 Make backup copies of your diskettes and store them in a safe place.(See Section 5.0 for this procedure).
- 8 Never bend, flex, or fold a diskette as permanent damage will result. Do not insert a folded diskette as it will damage the disc drive.



A6678

C

Care and Handling of Diskettes

R EFFECTIVITY: ALL

R
050B

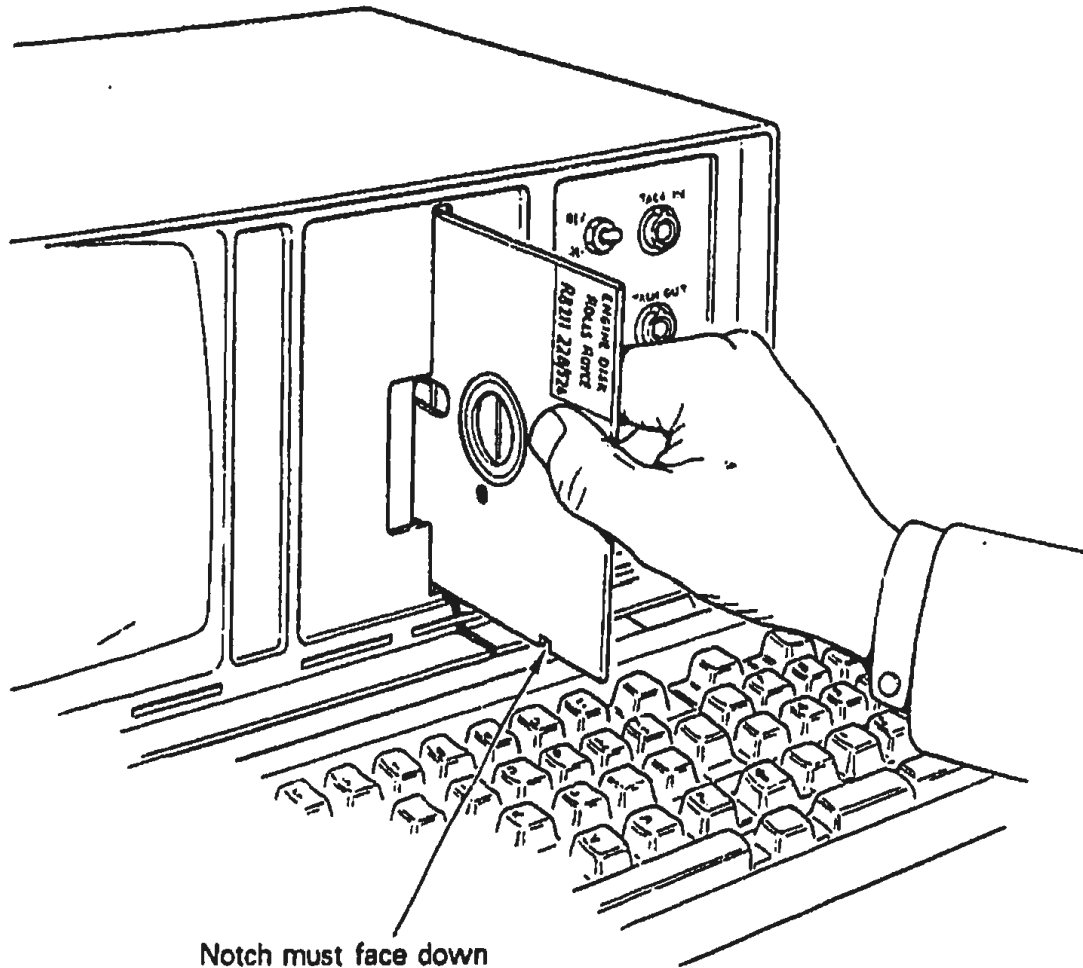
8G

71-00-00

Page 565
Dec 15/91



RB.211 Propulsion System MAINTENANCE



Notch must face down

A6685

Inserting a Diskette
Fig. 513

C
C

R EFFECTIVITY: ALL
R
050B

71-00-00
Page 566
Dec 15/91

8G



RB.211 Propulsion System

MAINTENANCE

17. Test No.17 - Oil System Filter Contamination Test

CR NOTE: Use maintenance sheet M11-79-01 and comply with it's
CR contents.

C Engines which have not been run tend to release carbon deposits into the oil system resulting in contamination of the oil filters. This could result in subsequent oil loss and/or engine shut-down. This test is to stimulate carbon release from the oil system by ground running the engine.

NOTE: On engines without S.B.72-5528, remove the internal gearbox scavenge strainer element and refit MCD (or sealing plug) (Ref.72-01-00, R/I) prior to commencing test. Refit scavenge strainer element (Ref.72-01-00 R/I) on completion of test.

C A. Start engine (Ref. 71-00-00, Maintenance Practices, Para.9.).

Engine condition: No air offtake I.D.G. disconnected or minimum load of 5 kilowatts.

B. Run engine at ground idle for 5 minutes. This operation can be omitted providing 5 minute run called for under 71-00-00, Maintenance Practices has been accomplished.

C C. Advance throttle lever slowly to achieve 1.35 E.P.R. and run at this power setting for 10 minutes, ensuring operating limitations are not exceeded.

NOTE: Monitor oil pressure, temperature and quantity. If OIL L.P. WARNING light illuminates or any parameter is likely to be exceeded, terminate test and repeat test with clean filters.

D. Decelerate engine to ground idle and run at ground idle for 5 minutes.

C E. Stop engine (Ref. 71-00-00, Maintenance Practices, Para.11A). The 5 minute run at ground idle called for under 71-00-00, Maintenance Practices can be omitted providing para.D. has been accomplished.

EFFECTIVITY: ALL

050B

8G

71-00-00

Page 567
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

- F. Remove fine scavenge and pressure filters (Ref. 72-01-00, Removal/Installation) and visually inspect for contamination. If no contamination visible, fit clean fine scavenge and pressure filters (Ref. 72-01-00, Removal/Installation).

If fine scavenge and pressure filters contaminated, fit clean filters (Ref. 72-01-00, Removal/Installation), then repeat operations A. through F.

- G. If I.D.G. disconnected prior to run, reconnect I.D.G.

C 18. Test No.18 Fuel Control Amplifier Function Test

- R The purpose of this test is to provide a procedure for testing the Fuel Control Amplifier and L.P. and H.P. Fuel Pump function when suitable test sets are not available and high power running is prohibited.

- A. Engine condition: No air offtake, I.D.G. disconnected or a minimum load of 5 kilowatts.

Commence start cycle, (Ref. 71-00-00, Maintenance Practices).

During start cycle observe N3 indicator and on reaching 30 to 35% N3 open and tag the FUEL CONT AMP circuit breaker on Flight Engineers/Second Officers aft circuit breaker panel CB3, zone 215. On attaining ground idle stabilise for 5 minutes.

- B. Slowly advance throttle lever and observe engine power is limited below 1.30 E.P.R.
- C. Close throttle lever to ground idle position. On attaining ground idle close FUEL CONT AMP circuit breaker opened in A.
- D. If check at B is within E.P.R. limits check the Fuel Control Amplifier datum and overspeed settings on arrival at a base with the required test sets (Ref. 73-21-00, Adjustment/Test).
- E. If check at B is not within E.P.R. limits change amplifier and repeat A, B and C.

EFFECTIVITY: ALL

050B

8G

71-00-00

Page 568
Dec 15/92



RB.211 Propulsion System

MAINTENANCE

F. Stabilise at ground idle for 5 minutes. Stop engine (Ref. 71-00-00, Maintenance Practices).

G. If I.D.G. disconnected prior to run, re-connect I.D.G.

C 19. Test No.19, Low Pressure Fuel Pump Drive Test

This test is to ascertain the integrity of the L.P. fuel pump drive shaft, and is to be effected only when directed by 73-00-00, Fault Isolation.

C A. Start engine (Ref.71-00-00, Maintenance Practices, Para.9) and stabilize at ground idle.

Engine condition: No air offtake, I.D.G. disconnected or minimum load of 5 kilowatts.

B. Select to OFF, relevant fuel tank booster pump switches and close relevant crossfeed valve(s) for engine under test.

C. Advance throttle lever to achieve approximately 70% N3.

D. Check FUEL PRESSURE indicator light.

(1) Light OUT - indicates L.P. fuel pump drive functioning.

(2) Light ON - indicates L.P. fuel pump drive failure (Refer to 73-00-00, Fault Isolation for further action).

C E. Reduce power to ground idle and shut down engine (Ref. 71-00-00, Maintenance Practices, Para.11A).

F. If I.D.G. disconnected prior to run, reconnect I.D.G.

R
R

EFFECTIVITY: ALL

0508

8G

71-00-00
Page 569
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

. C 19A. Test Number 19A (Alternate Procedure Low Pressure Fuel Pump Drive Test)

C This is an alternate procedure to ascertain the integrity of the
C L.P. fuel pump drive shaft. This procedure may be used in lieu
C of the regular Test 19 when directed by 73-00-00 Fault Isolation.
C The alternate procedure uses pressure indication and will not
C require installation of a known operative fuel low pressure switch
C to dispatch MEL.

C A. Obtain RB211 L.P. fuel pump output tester 73-00-02-0042.

C B. Disconnect electrical connector and remove fuel temperature
C probe from engine fuel filter.

C C. Install gauge interface connector from kit and connect to
C pressure gauge.

C D. Start engine (Reference 71-00-00 Maintenance Practices) and
C stabilize at ground idle with no air offtake and minimum
C electrical load of 5 kw.

C E. Select to off relevant fuel tank booster pump switches and
C close relevant crossfeed valve(s) for engine under test.

C F. Pull ground idle circuit breaker and allow engine to
C accelerate to flight idle.

C G. Check pressure on tester gauge.

C (1) 30 psi or above indicates operative L.P. fuel pump drive.

C (2) Pressures below 30 psi indicate failure of the L.P. fuel
C pump drive. (Refer to 73-00-00 Fault Isolation for
C further action).

C H. Reset idle circuit breaker. Allow engine to stabilize at
C ground idle and shut down engine. (Reference 71-00-00
C Maintenance Practices).

C I. Remove gauge and interface connector from engine fuel filter.

C J. Reinstall fuel temperature probe and reconnect electrical
C connector.

20. Test No.20

Number not used in order to relate test numbering and Overhaul Schedule.



RB.211 Propulsion System

MAINTENANCE

21. Low Ambient Temperature H.P. Compressor Drum Oil Contamination Test - Test No.21

Engines which have been subject to cold soak at low ambient temperature may suffer substantial loss of oil quantity during prolonged or repeated start cycles. Should the oil quantity fail to recover, it must be assumed that oil has entered the H.P. compressor drum. Under these oil loss circumstances only, it is permissible to purge the drum of oil using the following test procedure.

The following test must only be accomplished when called for during Fault Isolation procedure for oil hiding (severe loss of oil contents) (Ref.79-00-00).

- A. Obtain and record O.A.T. and pressure altitude.
 - B. Establish and record take-off E.P.R.
 - C. Check oil level and top up as required (Ref.12-12-01, Engine Oil Replenishment).
 - D. Start engine (Ref.71-00-00, Maintenance Practices) Engine condition: No air offtake, I.D.G. disconnected or minimum load of 5 kilowatts.
 - E. ON ENGINE STATUS PANEL, zone 215 ensure:
FAN or A switchlight - ON
TURB or B switchlight - OFF
Vibration rotary switch - NORM
 - F. Run engine at ground idle for 5 minutes. This operation can be omitted provided 5 minute run at ground idle in starting engine has been accomplished.
 - G. Slowly advance throttle lever maintaining NORM (Broad Band) vibration level within limits (Ref.71-00-00 Maintenance Practices) until E.P.R. recorded in operation B is achieved. Continue running engine at take-off E.P.R. until vibration levels have stabilised.
- NOTE: Engine must only be run at take-off E.P.R. for a maximum of 5 minutes.
- H. Close throttle lever to ground idle position and stabilise for 5 minutes.

R EFFECTIVITY: ALL

050B

86

71-00-00
Page 571
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

- J. Slowly advance throttle lever to take-off E.P.R. and check vibration levels are within limits.
- K. Close throttle lever to ground idle position and stabilise for 5 minutes.
- L. Stop engine (Ref. 71-00-00, Maintenance Practices). The 5 minute run called for under 71-00-00 Maintenance Practices can be omitted provided operation K. has been accomplished.
- M. Check oil quantity gauge normal.

22. Propulsion System Adjustments

Service Bulletins referred to:

Plessey S.B. 75-28-2350 - Revised Trim A Orifice
Plessey S.B. I.G.V. 75-13 (Mod. 2178) - Improved Trim B

A. Adjust Ground Idle

- (1) Equipment required:

T.443595 Adjusting spanner

- (2) Open left-hand hinged cowl 413A or 423A for engines No.1 and 3 (Ref. 71-11-00, Servicing), or 433AL for engine No.2 (Ref. 71-12-01, Servicing).

- (3) Refer to fig. 520, using spanner turn adjuster clockwise to decrease ground idle r.p.m., or anti-clockwise to increase ground idle r.p.m.

NOTE: 1/8 of a turn alters ground idle r.p.m. by approximately 1.0% N1.

- (4) Close left-hand hinged cowl 413A or 423A for engines No.1 and 3 (Ref. 71-11-00, Servicing), or 433AL for engine No.2 (Ref. 71-12-01, Servicing).

B. Adjust Acceleration

- (1) Equipment required:

T.443595 Adjusting spanner

R EFFECTIVITY: ALL

050B

8G

71-00-00
Page 572
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

- (2) Open left-hand hinged cowl, 413A or 423A for engines No.1 and 3 (Ref. 71-11-00, Servicing) or 433AL for engine No.2 (Ref. 71-12-01, Servicing).

- C (3) Refer to fig.520, using spanner turn adjuster anti-clockwise to lengthen (increase) acceleration time, or clockwise to shorten (decrease) acceleration time.

NOTE: 1 turn of adjuster alters time by approximately 1 second.

- (4) Close left-hand hinged cowl, 413A or 423A for engines No.1 and 3 (Ref. 71-11-00, Servicing) or 433AL for engine No.2 (Ref. 71-12-01, Servicing).

C. Adjust Deceleration

- (1) Equipment required:

T.443595 Adjusting spanner

- (2) Open left-hand hinged cowl, 413A or 423A for engines No.1 and 3 (Ref. 71-11-00, Servicing) or 433AL for engine No.2 (Ref. 71-12-01, Servicing)

- C (3) Refer to fig.520, using spanner turn adjuster anti-clockwise to lengthen (increase) deceleration time, or clockwise to shorten (decrease) deceleration time.

NOTE: 1 turn of adjuster alters time by approximately 2 seconds.

- (4) Close left-hand hinged cowl, 413A or 423A for engines No.1 and 3 (Ref. 71-11-00, Servicing) or 433AL for engine No.2 (Ref. 71-12-01, Servicing).

D. Adjust Maximum Power

- (1) Equipment required:

T.443595 Adjusting spanner

- (2) Open left-hand hinged cowl, 413A or 423A for engines No.1 and 3 (Ref. 71-11-00, Servicing) or 433AL for engine No.2 (Ref. 71-12-01, Servicing).

R EFFECTIVITY: ALL

050B

8G

71-00-00

Page 573
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

. C

- (3) Refer to fig.520, using spanner turn adjuster clockwise to decrease E.P.R., or anti-clockwise to increase E.P.R.

NOTE: During calibration the nut on friction locked adjuster is set flush with bottom of slot in surrounding housing. 1 turn of adjuster alters E.P.R. by 0.008 at take-off power.

- (4) Close left-hand hinged cowl 413A or 423A for engines No.1 and 3 (Ref. 71-11-00, Servicing) or 433AL for engine No.2 (Ref. 71-12-01, Servicing).

E. Adjust I.P. Compressor Airflow Control System

- (1) Equipment required:

3501631 or Plessey

558/1/01696 .

CP.20309 or XUT.37594

or (XUT.42526

(XUT.42527

Adjusting tool

Working platform

Spacer

Side piece

- (2) WARNING: ENSURE THRUST REVERSER IS LOCKED IN FORWARD THRUST POSITION WHILE WORK IS IN PROGRESS.

Deactivate and tag thrust reverser and associated systems, and fit thrust reverser mechanical locks (Ref. 78-30-00, Servicing).

- (3) Position working platform in cold stream duct.

- (4) Enter cold stream duct and open pressure relief door in compressor section right-hand front gas generator fairing (Ref. 72-03-00).

R EFFECTIVITY: ALL

050B

86

71-00-00

Page 574
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

(5) Adjust V.I.G.V. datum setting (Trim 'B')

CAUTION: ON UNITS NOT INCORPORATING PLESSEY S.B.75-28-2350, ADJUSTMENT OF THE MASTER RAM TRIM 'B' MUST BE LIMITED TO 4 CLICKS CLOCKWISE OR ANTI-CLOCKWISE FROM THE RIG DATUM SETTING MARK (REF.FIG.521). THEREFORE IF THE ARROW ON THE SQUARE ADJUSTER IS NOT POINTING TO AND ALIGNED WITH THE DATUM SETTING MARK, THE NUMBER OF CLICKS TO BRING THE ARROW AND SETTING MARK INTO ALIGNMENT MUST BE DETERMINED AND TAKEN INTO ACCOUNT BEFORE ANY FURTHER ADJUSTMENT IS MADE. IF SATISFACTORY SCHEDULING CANNOT BE OBTAINED WITHIN THIS ADJUSTMENT RANGE, THE MASTER RAM MUST BE CHANGED.

(a) Refer to fig.521, fit adjusting tool to datum adjuster. Turn adjuster clockwise to increase N2; anti-clockwise to decrease N2. One click alters N2 by 0.5 to 0.7% at any V.I.G.V. angle.

On master ram units incorporating Plessey S.B. I.G.V. 75-13 (Mod.2178) one click alters N2 by 0.35% (approximately) at any V.I.G.V. angle.

- (6) Close pressure relief door in compressor section right-hand front gas generator fairing (Ref. 72-03-00).
- (7) Remove working platform from cold stream duct.
- (8) Unlock and reactivate thrust reverser and associated systems (Ref. 78-30-00, Servicing).



RB.211 Propulsion System

MAINTENANCE

PRESSURE
ALTITUDE
FEET

-1000 0 1000 2000 3000 4000

O.A.T.
DEG.C.

MINIMUM RATED THRUST E.P.R.

O.A.T.
DEG.F.

* -2	1.527	1.533	1.539	1.547	1.555	1.562	28.4
-1	1.527	1.533	1.539	1.547	1.555	1.562	30.2
0	1.527	1.533	1.539	1.547	1.555	1.562	32.0
1	1.527	1.533	1.539	1.547	1.555	1.562	33.8
2	1.527	1.533	1.539	1.547	1.555	1.562	35.6
3	1.527	1.533	1.539	1.547	1.555	1.562	37.4
4	1.527	1.533	1.539	1.547	1.555	1.562	39.2
5	1.527	1.533	1.539	1.547	1.555	1.562	41.0
6	1.527	1.533	1.539	1.547	1.555	1.562	42.8
7	1.527	1.533	1.539	1.547	1.555	1.562	44.6
8	1.527	1.533	1.539	1.547	1.555	1.562	46.4
9	1.527	1.533	1.539	1.547	1.555	1.562	48.2
10	1.527	1.533	1.539	1.547	1.555	1.562	50.0
11	1.527	1.533	1.539	1.547	1.555	1.562	51.8
12	1.527	1.533	1.539	1.547	1.555	1.562	53.6
13	1.527	1.533	1.539	1.547	1.555	1.562	55.4
14	1.527	1.533	1.539	1.547	1.555	1.562	57.2
15	1.527	1.533	1.539	1.547	1.555	1.562	59.0
16	1.527	1.533	1.539	1.547	1.555	1.562	60.8
17	1.527	1.533	1.539	1.547	1.555	1.562	62.6
18	1.527	1.533	1.539	1.547	1.555	1.562	64.4
19	1.527	1.533	1.539	1.547	1.555	1.562	66.2
20	1.527	1.533	1.539	1.547	1.555	1.562	68.0
21	1.527	1.533	1.539	1.547	1.555	1.562	69.8
22	1.527	1.533	1.539	1.547	1.555	1.557	71.6
23	1.527	1.533	1.539	1.547	1.555	1.553	73.4
24	1.527	1.533	1.539	1.547	1.551	1.549	75.2
25	1.527	1.533	1.539	1.547	1.547	1.545	77.0
26	1.527	1.533	1.539	1.543	1.542	1.541	78.8
27	1.527	1.533	1.538	1.539	1.538	1.536	80.6
28	1.527	1.533	1.534	1.535	1.535	1.532	82.4
29	1.527	1.532	1.530	1.530	1.529	1.527	84.2

* The minus 2 deg.C. (28.4 deg.F.) E.P.R. values also apply to temperatures lower than minus 2 deg.C.

A7030

Minimum Take-off E.P.R. (Engines without S.B.72-8700)
(minus 2 to plus 29 deg.C.; 28.5 to 84.2 deg.F.; no air off-takes)
Fig.514 (Sheet 1)

R EFFECTIVITY: ALL

050B

8G

71-00-00

Page 576
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

PRESSURE
ALTITUDE
FEET

5000

6000

7000

8000

9000

10000

O.A.T.
DEG.C.

MINIMUM RATED THRUST E.P.R.

O.A.T.
DEG.F.

* -2	1.569	1.576	1.583	1.591	1.599	1.606	28.4
-1	1.569	1.576	1.583	1.591	1.599	1.606	30.2
0	1.569	1.576	1.583	1.591	1.599	1.606	32.0
1	1.569	1.576	1.583	1.591	1.599	1.606	33.8
2	1.569	1.576	1.583	1.591	1.599	1.606	35.6
3	1.569	1.576	1.583	1.591	1.599	1.606	37.4
4	1.569	1.576	1.583	1.591	1.599	1.606	39.2
5	1.569	1.576	1.583	1.591	1.599	1.606	41.0
6	1.569	1.576	1.583	1.591	1.599	1.606	42.8
7	1.569	1.576	1.583	1.591	1.599	1.606	44.6
8	1.569	1.576	1.583	1.591	1.599	1.606	46.4
9	1.569	1.576	1.583	1.591	1.599	1.606	48.2
10	1.569	1.576	1.583	1.591	1.599	1.603	50.0
11	1.569	1.576	1.583	1.591	1.599	1.600	51.8
12	1.569	1.576	1.583	1.591	1.595	1.596	53.6
13	1.569	1.576	1.583	1.591	1.591	1.591	55.4
14	1.569	1.576	1.583	1.588	1.587	1.587	57.2
15	1.569	1.576	1.583	1.584	1.583	1.582	59.0
16	1.569	1.576	1.579	1.580	1.579	1.578	60.8
17	1.569	1.576	1.575	1.576	1.575	1.574	62.6
18	1.569	1.572	1.572	1.571	1.571	1.570	64.4
19	1.569	1.569	1.568	1.567	1.567	1.566	66.2
20	1.566	1.565	1.564	1.563	1.563	1.562	68.0
21	1.562	1.561	1.560	1.559	1.558	1.558	69.8
22	1.557	1.556	1.555	1.554	1.554	1.553	71.6
23	1.553	1.552	1.551	1.550	1.549	1.549	73.4
24	1.548	1.547	1.546	1.545	1.545	1.544	75.2
25	1.544	1.543	1.542	1.541	1.540	1.540	77.0
26	1.539	1.538	1.537	1.537	1.536	1.535	78.8
27	1.535	1.534	1.533	1.532	1.531	1.531	80.6
28	1.530	1.529	1.528	1.528	1.527	1.526	82.4
29	1.526	1.525	1.524	1.523	1.522	1.522	84.2

* The minus 2 deg.C. (28.4 deg.F.) E.P.R. values also apply to temperatures lower than minus 2 deg.C.

A7031

Minimum Take-off E.P.R. (Engines without S.B.72-8700)
(minus 2 to plus 29 deg.C.; 28.5 to 84.2 deg.F.; no air off-takes)
Fig.514 (Sheet 2)

R EFFECTIVITY: ALL

050B

8G

71-00-00
Page 577
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

PRESSURE ALTITUDE FEET	-1000	0	1000	2000	3000	4000	
O.A.T. DEG.C.	MINIMUM RATED THRUST E.P.R.						O.A.T. DEG.F.
* -2	1.551	1.557	1.563	1.571	1.580	1.587	28.4
-1	1.551	1.557	1.563	1.571	1.580	1.587	30.2
0	1.551	1.557	1.563	1.571	1.580	1.587	32.0
1	1.551	1.557	1.563	1.571	1.580	1.587	33.8
2	1.551	1.557	1.563	1.571	1.580	1.587	35.6
3	1.551	1.557	1.563	1.571	1.580	1.587	37.4
4	1.551	1.557	1.563	1.571	1.580	1.587	39.2
5	1.551	1.557	1.563	1.571	1.580	1.587	41.0
6	1.551	1.557	1.563	1.571	1.580	1.587	42.8
7	1.551	1.557	1.563	1.571	1.580	1.587	44.6
8	1.551	1.557	1.563	1.571	1.580	1.587	46.4
9	1.551	1.557	1.563	1.571	1.580	1.587	48.2
10	1.551	1.557	1.563	1.571	1.580	1.587	50.0
11	1.551	1.557	1.563	1.571	1.580	1.587	51.8
12	1.551	1.557	1.563	1.571	1.580	1.587	53.6
13	1.551	1.557	1.563	1.571	1.580	1.587	55.4
14	1.551	1.557	1.563	1.571	1.580	1.587	57.2
15	1.551	1.557	1.563	1.571	1.580	1.587	59.0
16	1.551	1.557	1.563	1.571	1.580	1.585	60.8
17	1.551	1.557	1.563	1.571	1.580	1.580	62.6
18	1.551	1.557	1.563	1.571	1.578	1.576	64.4
19	1.551	1.557	1.563	1.571	1.573	1.571	66.2
20	1.551	1.557	1.563	1.569	1.569	1.567	68.0
21	1.551	1.557	1.563	1.564	1.564	1.562	69.8
22	1.551	1.557	1.561	1.560	1.559	1.557	71.6
23	1.551	1.557	1.556	1.555	1.555	1.553	73.4
24	1.551	1.555	1.552	1.551	1.551	1.549	75.2
25	1.545	1.550	1.547	1.547	1.547	1.545	77.0
26	1.540	1.546	1.543	1.543	1.542	1.541	78.8
27	1.536	1.541	1.538	1.539	1.538	1.536	80.6
28	1.531	1.537	1.534	1.535	1.535	1.532	82.4
29	1.527	1.532	1.530	1.530	1.529	1.527	84.2

* The minus 2 deg.C. (28.4 deg.F.) E.P.R. values also apply to temperatures lower than minus 2 deg.C.

A7028

Minimum Take-off E.P.R. (Engines with S.B.72-8700)
(minus 2 to plus 29 deg.C.; 28.5 to 84.2 deg.F.; no air off-takes)
Fig.514 (Sheet 3)

R
R
050B

EFFECTIVITY: ALL

8G

71-00-00
Page 578
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

PRESSURE
ALTITUDE
FEET

5000 6000 7000 8000 9000 10000

O.A.T.
DEG.C.

MINIMUM RATED THRUST E.P.R.

O.A.T.
DEG.F.

* -2	1.594	1.599	1.601	1.603	1.604	1.606	28.4
-1	1.594	1.599	1.601	1.603	1.604	1.606	30.2
0	1.594	1.599	1.601	1.603	1.604	1.606	32.0
1	1.594	1.599	1.601	1.603	1.604	1.606	33.8
2	1.594	1.599	1.601	1.603	1.604	1.606	35.6
3	1.594	1.599	1.601	1.603	1.604	1.606	37.4
4	1.594	1.599	1.601	1.603	1.604	1.606	39.2
5	1.594	1.599	1.601	1.603	1.604	1.606	41.0
6	1.594	1.599	1.601	1.603	1.604	1.606	42.8
7	1.594	1.599	1.601	1.603	1.604	1.606	44.6
8	1.594	1.599	1.601	1.603	1.604	1.606	46.4
9	1.594	1.599	1.601	1.603	1.604	1.606	48.2
10	1.594	1.599	1.601	1.603	1.604	1.603	50.0
11	1.594	1.599	1.601	1.601	1.599	1.600	51.8
12	1.594	1.599	1.597	1.596	1.595	1.596	53.6
13	1.594	1.594	1.592	1.591	1.591	1.591	55.4
14	1.592	1.590	1.588	1.588	1.587	1.587	57.2
15	1.587	1.585	1.583	1.584	1.583	1.582	59.0
16	1.583	1.581	1.579	1.580	1.579	1.578	60.8
17	1.578	1.576	1.575	1.576	1.575	1.574	62.6
18	1.574	1.572	1.572	1.571	1.571	1.570	64.4
19	1.569	1.569	1.568	1.567	1.567	1.566	66.2
20	1.566	1.565	1.564	1.563	1.563	1.562	68.0
21	1.562	1.561	1.560	1.559	1.558	1.558	69.8
22	1.557	1.556	1.555	1.554	1.554	1.553	71.6
23	1.553	1.552	1.551	1.550	1.549	1.549	73.4
24	1.548	1.547	1.546	1.545	1.545	1.544	75.2
25	1.544	1.543	1.542	1.541	1.540	1.540	77.0
26	1.539	1.538	1.537	1.537	1.536	1.535	78.8
27	1.535	1.534	1.533	1.532	1.531	1.531	80.6
28	1.530	1.529	1.528	1.528	1.527	1.526	82.4
29	1.526	1.525	1.524	1.523	1.522	1.522	84.2

* The minus 2 deg.C. (28.4 deg.F.) E.P.R. values also apply to temperatures lower than minus 2 deg.C.

A7029

Minimum Take-off E.P.R. (Engines with S.B.72-8700)
(minus 2 to plus 29 deg.C.; 28.5 to 84.2 deg.F.; no air off-takes)
Fig.514 (Sheet 4)

R EFFECTIVITY: ALL

050B

8G

71-00-00

Page 579
Dec 15/91

RB.211 Propulsion System
MAINTENANCE

PRESSURE ALTITUDE FEET	-1000	0	1000	2000	3000	4000	
O.A.T. DEG.C.	MINIMUM RATED THRUST E.P.R.						O.A.T. DEG.F.
30	1.527	1.528	1.526	1.525	1.524	1.523	86.0
31	1.527	1.523	1.522	1.521	1.520	1.518	87.8
32	1.521	1.519	1.517	1.516	1.515	1.514	89.6
33	1.515	1.514	1.513	1.512	1.511	1.509	91.4
34	1.512	1.510	1.508	1.507	1.506	1.505	93.2
35	1.506	1.505	1.504	1.503	1.502	1.500	95.0
36	1.503	1.501	1.499	1.498	1.497	1.496	96.8
37	1.497	1.496	1.495	1.494	1.493	1.491	98.6
38	1.494	1.492	1.490	1.489	1.488	1.487	100.4
39	1.488	1.487	1.486	1.485	1.484	1.482	102.2
40	1.485	1.483	1.481	1.480	1.479	1.478	104.0
41	1.481	1.479	1.477	1.476	1.475	1.474	105.8
42	1.476	1.474	1.473	1.472	1.471	1.470	107.6
43	1.472	1.470	1.468	1.467	1.466	1.465	109.4
44	1.466	1.465	1.464	1.463	1.462	1.461	111.2
45	1.462	1.461	1.460	1.459	1.458	1.457	113.0
46	1.457	1.457	1.457	1.455	1.454	1.453	114.8
47	1.454	1.453	1.452	1.451	1.450	1.449	116.6
48	1.450	1.449	1.448	1.446	1.445	1.444	118.4
49	1.447	1.445	1.443	1.442	1.441	1.440	120.2
50	1.443	1.441	1.439	1.438	1.437	1.436	122.0
51	1.439	1.437	1.435	1.434	1.433	1.432	123.8
52	1.432	1.433	1.432	1.431	1.429	1.428	125.6
53	1.432	1.430	1.428	1.427	1.426	1.425	127.4
54	1.427	1.426	1.425	1.424	1.422	1.421	129.2
55	1.423	1.422	1.421	1.420	1.418	1.417	131.0

A7032

Minimum Take-off E.P.R. (Engines with and without S.B.72-8700)
(30 to 59 deg.C.; 86 to 131 deg.F.; no air off-takes)
Fig.514 (Sheet 5)

R EFFECTIVITY: ALL

050B

8G

71-00-00
Page 580
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

PRESSURE
ALTITUDE
FEET

5000

6000

7000

8000

9000

10000

O.A.T.
DEG.C.

MINIMUM RATED THRUST E.P.R.

O.A.T.
DEG.F.

30	1.522	1.520	1.519	1.519	1.518	1.517	86.0
31	1.517	1.516	1.514	1.514	1.513	1.512	87.8
32	1.513	1.511	1.510	1.510	1.509	1.508	89.6
33	1.508	1.507	1.505	1.505	1.504	1.503	91.4
34	1.504	1.502	1.501	1.501	1.500	1.499	93.2
35	1.499	1.498	1.496	1.496	1.495	1.494	95.0
36	1.494	1.493	1.492	1.491	1.490	1.489	96.8
37	1.490	1.489	1.487	1.487	1.486	1.485	98.6
38	1.485	1.484	1.483	1.482	1.481	1.480	100.4
39	1.481	1.480	1.478	1.478	1.477	1.476	102.2
40	1.476	1.475	1.474	1.473	1.472	1.471	104.0
41	1.472	1.471	1.470	1.469	1.468	1.467	105.8
42	1.468	1.467	1.466	1.464	1.463	1.462	107.6
43	1.463	1.462	1.461	1.460	1.459	1.458	109.4
44	1.459	1.458	1.457	1.455	1.454	1.453	111.2
45	1.455	1.454	1.453	1.451	1.450	1.449	113.0
46	1.451	1.450	1.449	1.447	1.446	1.445	114.8
47	1.447	1.446	1.445	1.443	1.442	1.441	116.6
48	1.443	1.441	1.440	1.440	1.439	1.438	118.4
49	1.439	1.437	1.436	1.436	1.435	1.434	120.2
50	1.435	1.433	1.432	1.432	1.431	1.430	122.0
51	1.431	1.429	1.428	1.427	1.427	1.426	123.8
52	1.427	1.426	1.425	1.423	1.423	1.422	125.6
53	1.424	1.423	1.421	1.420	1.420	1.419	127.4
54	1.420	1.419	1.418	1.416	1.416	1.415	129.2
55	1.416	1.415	1.414	1.413	1.412	1.411	131.0

A7033

Minimum Take-off E.P.R. (Engines with and without S.B.72-8700)
(30 to 59 deg.C.; 86 to 131 deg.F.; no air off-takes)
Fig.514 (Sheet 6)

R EFFECTIVITY: ALL

R
0508

86

71-00-00
Page 581
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

RB211-22B MAXIMUM ACCEPTANCE LIMITS

RAM ADJUST _____ CLICKS CWCCW

Δ P LITES ON _____ TIMES

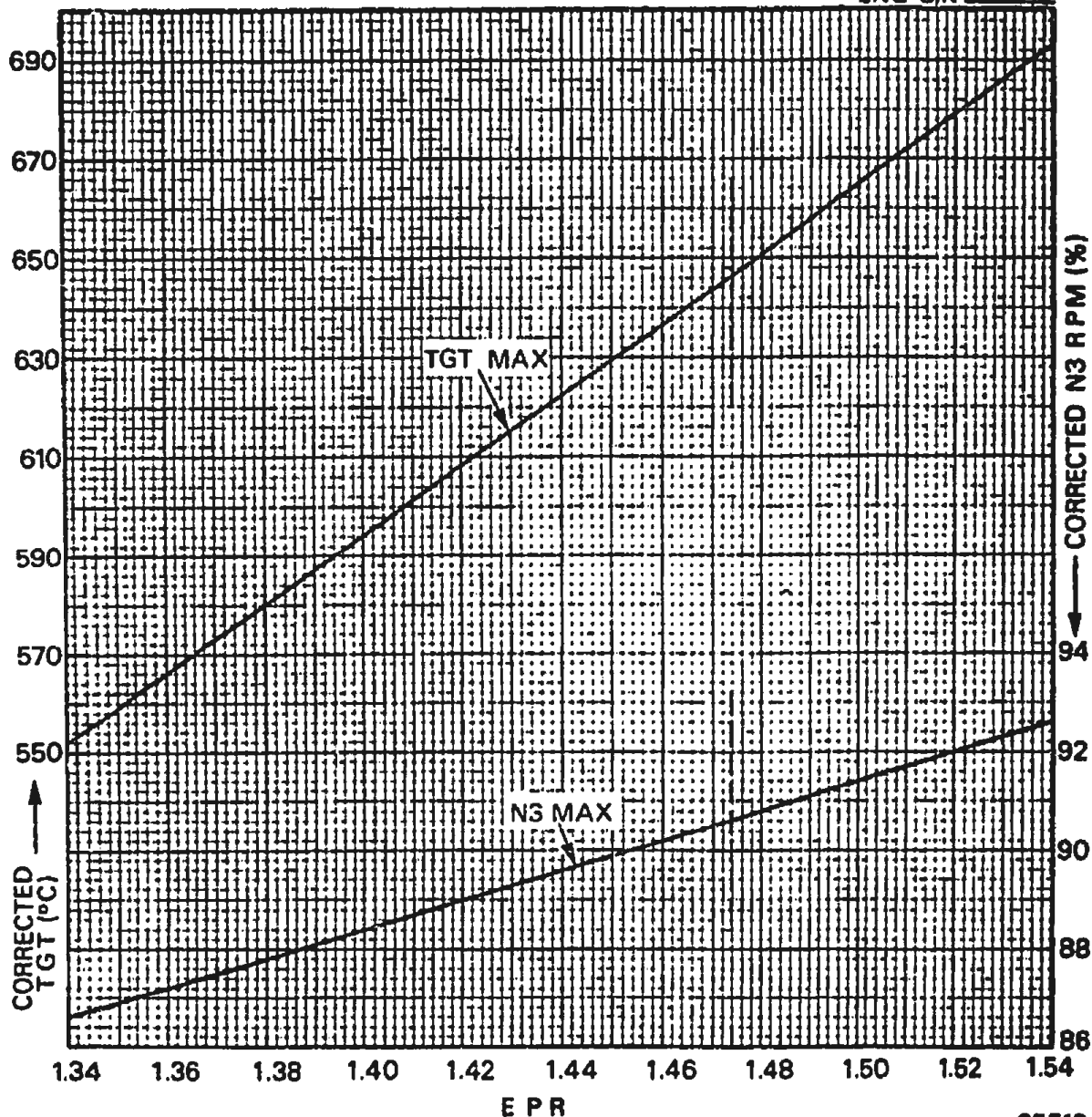
PLANE _____

DATE _____

STA _____

ENG PSN _____

ENG S/N _____



65516

RB211-22B Maximum Acceptance Limits
Fig.515 (Sheet 1 of 2)

C
C

R EFFECTIVITY: ALL

050B

8G

71-00-00

Page 582
Dec 15/91

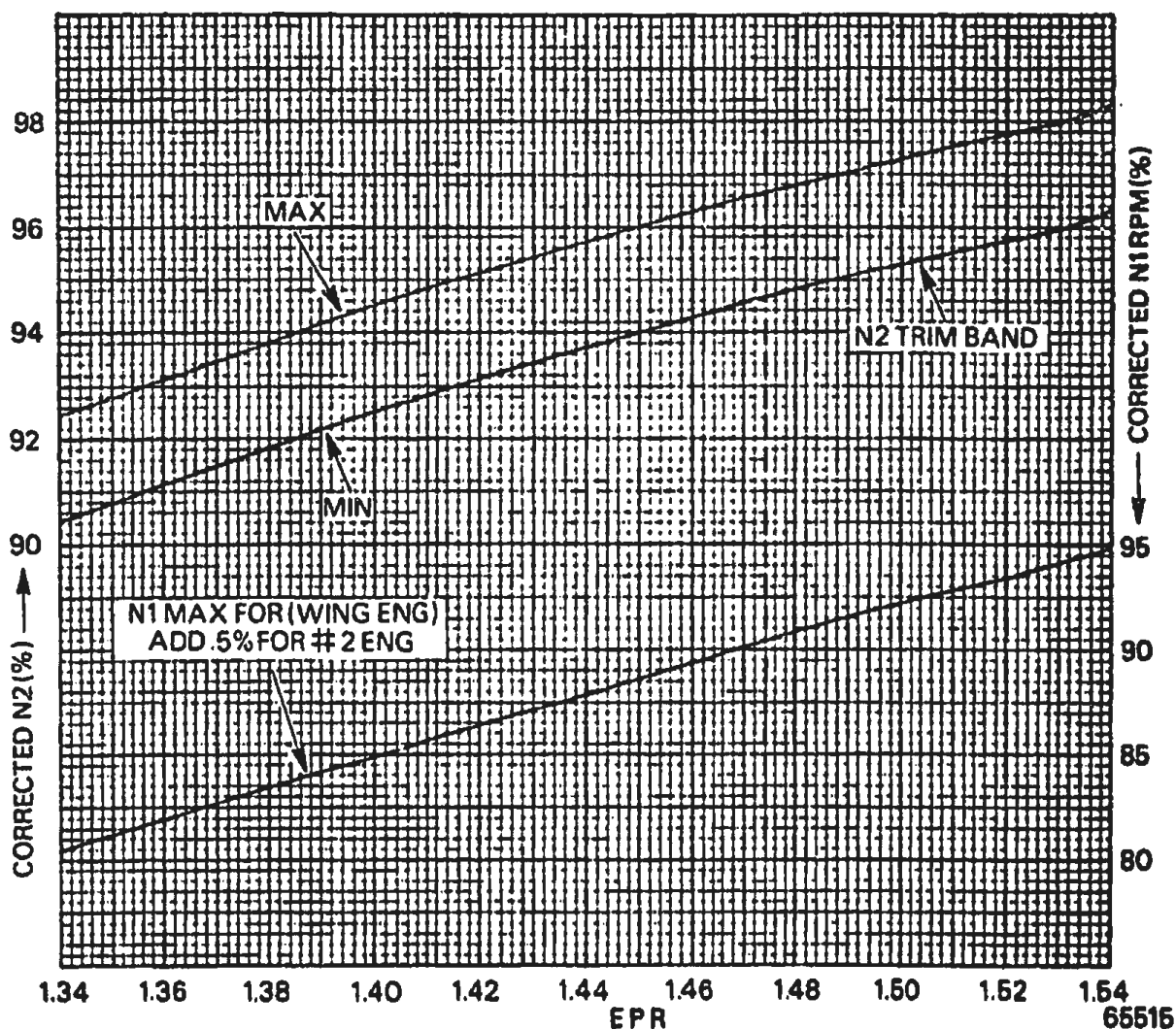


RB.211 Propulsion System

MAINTENANCE

RB 211-22B MAXIMUM ACCEPTANCE LIMITS
RAM ADJUST _____ CLICKS CW CWW
Δ P LITES ON _____ TIMES

PLANE _____
DATE _____
STA _____
ENG PSN _____
ENG S/N _____



RB211-22B Maximum Acceptance Limits
Fig.515 (Sheet 2 of 2)

C
C

R EFFECTIVITY: ALL

050B

86

71-00-00

Page 583
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

OAT		OBSERVED N% RPM ON PRECISION TACHOMETER											
°F	°C	48	50	52	54	56	58	60	62	64	66	68	68
-40	-40.0	+5.4	+5.6	+5.8	+6.0	+6.3	+6.5	+6.7	+6.9	+7.1	+7.4	+7.6	
-38	-38.9	+5.2	+5.4	+5.7	+5.9	+6.1	+6.3	+6.5	+6.8	+7.0	+7.2	+7.4	
-36	-37.8	+5.1	+5.3	+5.5	+5.7	+6.0	+6.2	+6.4	+6.6	+6.8	+7.0	+7.2	
-34	-36.7	+5.0	+5.2	+5.4	+5.6	+5.8	+6.0	+6.2	+6.4	+6.6	+6.8	+7.1	
-32	-35.6	+4.9	+5.1	+5.3	+5.5	+5.7	+5.9	+6.1	+6.3	+6.5	+6.7	+6.9	
-30	-34.4	+4.7	+4.9	+5.1	+5.3	+5.5	+5.7	+5.9	+6.1	+6.3	+6.5	+6.7	
-28	-33.3	+4.6	+4.8	+5.0	+5.2	+5.4	+5.6	+5.8	+6.0	+6.1	+6.3	+6.5	
-26	-32.2	+4.5	+4.7	+4.9	+5.1	+5.2	+5.4	+5.6	+5.8	+6.0	+6.2	+6.4	
-24	-31.1	+4.4	+4.6	+4.7	+4.9	+5.1	+5.3	+5.5	+5.6	+5.8	+6.0	+6.2	
-22	-30.0	+4.3	+4.4	+4.6	+4.8	+5.0	+5.1	+5.3	+5.5	+5.7	+5.8	+6.0	
-20	-28.9	+4.1	+4.3	+4.5	+4.6	+4.8	+5.0	+5.2	+5.3	+5.5	+5.7	+5.8	
-18	-27.8	+4.0	+4.2	+4.3	+4.5	+4.7	+4.8	+5.0	+5.2	+5.4	+5.5	+5.7	
-16	-26.7	+3.9	+4.1	+4.2	+4.4	+4.5	+4.7	+4.9	+5.0	+5.2	+5.4	+5.5	
-14	-25.6	+3.8	+3.9	+4.1	+4.3	+4.4	+4.6	+4.7	+4.9	+5.0	+5.2	+5.4	
-12	-24.4	+3.7	+3.8	+4.0	+4.1	+4.3	+4.4	+4.6	+4.7	+4.9	+5.0	+5.2	
-10	-23.3	+3.5	+3.7	+3.8	+4.0	+4.1	+4.3	+4.4	+4.6	+4.7	+4.9	+5.0	
- 8	-22.2	+3.4	+3.6	+3.7	+3.9	+4.0	+4.2	+4.3	+4.4	+4.6	+4.7	+4.9	
- 6	-21.1	+3.3	+3.5	+3.6	+3.7	+3.9	+4.0	+4.2	+4.3	+4.4	+4.6	+4.7	
- 4	-20.0	+3.2	+3.3	+3.5	+3.6	+3.7	+3.9	+4.0	+4.1	+4.3	+4.4	+4.5	
- 2	-18.9	+3.1	+3.2	+3.4	+3.5	+3.6	+3.7	+3.9	+4.0	+4.1	+4.3	+4.4	
- 0	-17.8	+3.0	+3.1	+3.2	+3.4	+3.5	+3.6	+3.7	+3.9	+4.0	+4.1	+4.2	
2	-16.7	+2.9	+3.0	+3.1	+3.2	+3.4	+3.5	+3.6	+3.7	+3.8	+4.0	+4.1	
4	-15.6	+2.8	+2.9	+3.0	+3.1	+3.2	+3.3	+3.5	+3.6	+3.7	+3.8	+3.9	
6	-14.4	+2.7	+2.8	+2.9	+3.0	+3.1	+3.2	+3.3	+3.4	+3.5	+3.7	+3.8	
8	-13.3	+2.5	+2.6	+2.7	+2.8	+2.9	+3.1	+3.2	+3.3	+3.4	+3.5	+3.6	
10	-12.2	+2.4	+2.5	+2.6	+2.7	+2.8	+2.9	+3.1	+3.2	+3.3	+3.4	+3.5	
12	-11.1	+2.3	+2.4	+2.5	+2.6	+2.7	+2.8	+2.9	+3.0	+3.1	+3.2	+3.3	
14	-10.0	+2.2	+2.3	+2.4	+2.5	+2.6	+2.7	+2.8	+2.9	+3.0	+3.1	+3.2	
16	- 8.9	+2.1	+2.2	+2.3	+2.4	+2.5	+2.6	+2.7	+2.7	+2.8	+2.9	+3.0	
18	- 7.8	+2.0	+2.1	+2.2	+2.3	+2.4	+2.4	+2.5	+2.6	+2.7	+2.8	+2.9	
20	- 6.7	+1.9	+2.0	+2.0	+2.2	+2.2	+2.3	+2.4	+2.5	+2.5	+2.6	+2.7	
22	- 5.6	+1.8	+1.9	+2.0	+2.0	+2.1	+2.2	+2.3	+2.3	+2.4	+2.5	+2.6	
24	- 4.4	+1.7	+1.8	+1.8	+1.9	+2.0	+2.1	+2.1	+2.2	+2.3	+2.3	+2.4	
26	- 3.3	+1.6	+1.7	+1.7	+1.8	+1.9	+1.9	+2.0	+2.1	+2.1	+2.2	+2.3	
28	- 2.2	+1.5	+1.6	+1.6	+1.7	+1.8	+1.8	+1.9	+1.9	+2.0	+2.1	+2.1	
30	- 1.1	+1.4	+1.5	+1.5	+1.6	+1.6	+1.7	+1.7	+1.8	+1.9	+1.9	+2.0	
32	- 0.0	+1.3	+1.4	+1.4	+1.5	+1.5	+1.6	+1.6	+1.7	+1.7	+1.8	+1.8	
34	1.1	+1.2	+1.2	+1.3	+1.3	+1.4	+1.4	+1.5	+1.5	+1.6	+1.6	+1.7	
36	2.2	+1.1	+1.1	+1.2	+1.2	+1.3	+1.3	+1.4	+1.4	+1.5	+1.5	+1.6	
38	3.3	+1.0	+1.0	+1.1	+1.1	+1.2	+1.2	+1.3	+1.3	+1.3	+1.4	+1.4	
40	4.4	+0.9	+0.9	+1.0	+1.0	+1.1	+1.1	+1.1	+1.2	+1.2	+1.2	+1.3	

36759A

C
C

RPM Temperature Correction
Fig.516 (Sheet 1)

R EFFECTIVITY: ALL

050B

8G

71-00-00

Page 584
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

OAT		OBSERVED % RPM ON PRECISION TACHOMETER											
°F	°C	48	50	52	54	56	58	60	62	64	66	68	
42	5.6	+0.8	+0.8	+0.9	+0.9	+0.9	+1.0	+1.0	+1.0	+1.1	+1.1	+1.1	
44	6.7	+0.7	+0.7	+0.8	+0.8	+0.8	+0.9	+0.9	+0.9	+0.9	+1.0	+1.0	
46	7.8	+0.6	+0.6	+0.7	+0.7	+0.7	+0.7	+0.8	+0.8	+0.8	+0.8	+0.9	
48	8.9	+0.5	+0.5	+0.6	+0.6	+0.6	+0.6	+0.7	+0.7	+0.7	+0.7	+0.7	
50	10.0	+0.4	+0.4	+0.5	+0.5	+0.5	+0.5	+0.5	+0.6	+0.6	+0.6	+0.6	
52	11.1	+0.3	+0.3	+0.4	+0.4	+0.4	+0.4	+0.4	+0.4	+0.4	+0.5	+0.5	
54	12.2	+0.2	+0.2	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3	
56	13.3	+0.1	+0.1	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2	
58	14.4	+0.0	+0.0	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	
60	15.6	-0.0	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	
62	16.7	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	
64	17.8	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	
66	18.9	-0.3	-0.3	-0.3	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.5	
68	20.0	-0.4	-0.4	-0.4	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.6	-0.6	
70	21.1	-0.5	-0.5	-0.5	-0.6	-0.6	-0.6	-0.6	-0.6	-0.7	-0.7	-0.7	
72	22.2	-0.6	-0.6	-0.6	-0.7	-0.7	-0.7	-0.7	-0.8	-0.8	-0.8	-0.8	
74	23.3	-0.7	-0.7	-0.7	-0.8	-0.8	-0.8	-0.8	-0.9	-0.9	-0.9	-1.0	
76	24.4	-0.8	-0.8	-0.8	-0.9	-0.9	-0.9	-1.0	-1.0	-1.0	-1.1	-1.1	
78	25.6	-0.9	-0.9	-0.9	-1.0	-1.0	-1.0	-1.1	-1.1	-1.1	-1.2	-1.2	
80	26.7	-0.9	-1.0	-1.0	-1.1	-1.1	-1.1	-1.2	-1.2	-1.3	-1.3	-1.3	
82	27.8	-1.0	-1.1	-1.1	-1.2	-1.2	-1.2	-1.3	-1.3	-1.4	-1.4	-1.5	
84	28.9	-1.1	-1.2	-1.2	-1.3	-1.3	-1.3	-1.4	-1.4	-1.5	-1.5	-1.6	
86	30.0	-1.2	-1.3	-1.3	-1.4	-1.4	-1.5	-1.5	-1.6	-1.6	-1.7	-1.7	
88	31.1	-1.3	-1.3	-1.4	-1.4	-1.5	-1.6	-1.6	-1.7	-1.7	-1.8	-1.8	
90	32.2	-1.4	-1.4	-1.5	-1.5	-1.6	-1.7	-1.7	-1.8	-1.8	-1.9	-1.9	
92	33.3	-1.5	-1.5	-1.6	-1.6	-1.7	-1.8	-1.8	-1.9	-1.9	-2.0	-2.1	
94	34.4	-1.5	-1.6	-1.7	-1.7	-1.8	-1.9	-1.9	-2.0	-2.1	-2.1	-2.2	
96	35.6	-1.6	-1.7	-1.8	-1.8	-1.9	-2.0	-2.0	-2.1	-2.2	-2.2	-2.3	
98	36.7	-1.7	-1.8	-1.9	-1.9	-2.0	-2.1	-2.1	-2.2	-2.3	-2.3	-2.4	
100	37.8	-1.8	-1.9	-1.9	-2.0	-2.1	-2.2	-2.2	-2.3	-2.4	-2.5	-2.5	
102	38.9	-1.9	-2.0	-2.0	-2.1	-2.2	-2.3	-2.3	-2.4	-2.5	-2.6	-2.7	
104	40.0	-2.0	-2.0	-2.1	-2.2	-2.3	-2.4	-2.4	-2.5	-2.6	-2.7	-2.8	
106	41.1	-2.0	-2.1	-2.2	-2.3	-2.4	-2.5	-2.5	-2.6	-2.7	-2.8	-2.9	
108	42.2	-2.1	-2.2	-2.3	-2.4	-2.5	-2.6	-2.6	-2.7	-2.8	-2.9	-3.0	
110	43.3	-2.2	-2.3	-2.4	-2.5	-2.6	-2.7	-2.7	-2.8	-2.9	-3.0	-3.1	
112	44.4	-2.3	-2.4	-2.5	-2.6	-2.7	-2.8	-2.8	-2.9	-3.0	-3.1	-3.2	
114	45.6	-2.4	-2.5	-2.6	-2.7	-2.8	-2.8	-2.9	-3.0	-3.1	-3.2	-3.3	
116	46.7	-2.4	-2.5	-2.6	-2.7	-2.8	-2.9	-3.0	-3.1	-3.2	-3.4	-3.5	
118	47.8	-2.5	-2.6	-2.7	-2.8	-2.9	-3.0	-3.1	-3.2	-3.4	-3.5	-3.6	
120	48.9	-2.6	-2.7	-2.8	-2.9	-3.0	-3.1	-3.2	-3.4	-3.5	-3.6	-3.7	
122	50.0	-2.7	-2.8	-2.9	-3.0	-3.1	-3.2	-3.3	-3.5	-3.6	-3.7	-3.8	
124	51.1	-2.8	-2.9	-3.0	-3.1	-3.2	-3.3	-3.4	-3.6	-3.7	-3.8	-3.9	

36760A

RPM Temperature Correction
Fig.516 (Sheet 2)

C
C

R EFFECTIVITY: ALL
R
050B

8G

71-00-00
Page 585
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

OAT		OBSERVED N% RPM ON PRECISION TACHOMETER											
°F	°C	70	72	74	76	78	80	82	84	86	88	90	
-40	-40.0	+7.8	+8.0	+8.3	+8.5	+8.7	+8.9	+9.2	+9.4	+9.6	+9.8	+10.0	
-38	-38.9	+7.6	+7.8	+8.1	+8.3	+8.5	+8.7	+8.9	+9.2	+9.4	+9.6	+ 9.8	
-36	-37.8	+7.4	+7.7	+7.9	+8.1	+8.3	+8.5	+8.7	+8.9	+9.1	+9.4	+ 9.6	
-34	-36.7	+7.3	+7.5	+7.7	+7.9	+8.1	+8.3	+8.5	+8.7	+8.9	+9.1	+ 9.3	
-32	-35.6	+7.1	+7.3	+7.5	+7.7	+7.9	+8.1	+8.3	+8.5	+8.7	+8.9	+ 9.1	
-30	-34.4	+6.9	+7.1	+7.3	+7.5	+7.7	+7.9	+8.1	+8.3	+8.5	+8.7	+ 8.9	
-28	-33.3	+6.7	+6.9	+7.1	+7.3	+7.5	+7.7	+7.9	+8.1	+8.3	+8.5	+ 8.6	
-26	-32.2	+6.5	+6.7	+6.9	+7.1	+7.3	+7.5	+7.7	+7.9	+8.0	+8.2	+ 8.4	
-24	-31.1	+6.4	+6.6	+6.7	+6.9	+7.1	+7.3	+7.5	+7.6	+7.8	+8.0	+ 8.2	
-22	-30.0	+6.2	+6.4	+6.6	+6.7	+6.9	+7.1	+7.3	+7.4	+7.6	+7.8	+ 8.0	
-20	-28.9	+6.0	+6.2	+6.4	+6.5	+6.7	+6.9	+7.1	+7.2	+7.4	+7.6	+ 7.7	
-18	-27.8	+5.9	+6.0	+6.2	+6.4	+6.5	+6.7	+6.9	+7.0	+7.2	+7.4	+ 7.5	
-16	-26.7	+5.7	+5.8	+6.0	+6.2	+6.3	+6.5	+6.7	+6.8	+7.0	+7.1	+ 7.3	
-14	-25.6	+5.5	+5.7	+5.8	+6.0	+6.1	+6.3	+6.5	+6.6	+6.8	+6.9	+ 7.1	
-12	-24.4	+5.3	+5.5	+5.6	+5.8	+6.0	+6.1	+6.3	+6.4	+6.6	+6.7	+ 6.9	
-10	-23.3	+5.2	+5.3	+5.5	+5.6	+5.8	+5.9	+6.1	+6.2	+6.4	+6.5	+ 6.7	
- 8	-22.2	+5.0	+5.2	+5.3	+5.4	+5.6	+5.7	+5.9	+6.0	+6.2	+6.3	+ 6.4	
- 6	-21.1	+4.8	+5.0	+5.1	+5.3	+5.4	+5.5	+5.7	+5.8	+6.0	+6.1	+ 6.2	
- 4	-20.0	+4.7	+4.8	+4.9	+5.1	+5.2	+5.3	+5.5	+5.6	+5.7	+5.9	+ 6.0	
- 2	-18.9	+4.5	+4.6	+4.8	+4.9	+5.0	+5.2	+5.3	+5.4	+5.5	+5.7	+ 5.8	
- 0	-17.8	+4.4	+4.5	+4.6	+4.7	+4.9	+5.0	+5.1	+5.2	+5.3	+5.5	+ 5.6	
2	-16.7	+4.2	+4.3	+4.4	+4.6	+4.7	+4.8	+4.9	+5.0	+5.2	+5.3	+ 5.4	
4	-15.6	+4.0	+4.1	+4.3	+4.4	+4.5	+4.6	+4.7	+4.8	+5.0	+5.1	+ 5.2	
6	-14.4	+3.9	+4.0	+4.1	+4.2	+4.3	+4.4	+4.5	+4.6	+4.8	+4.9	+ 5.0	
8	-13.3	+3.7	+3.8	+3.9	+4.0	+4.1	+4.2	+4.4	+4.5	+4.6	+4.7	+ 4.8	
10	-12.2	+3.6	+3.7	+3.8	+3.9	+4.0	+4.1	+4.2	+4.3	+4.4	+4.5	+ 4.6	
12	-11.1	+3.4	+3.5	+3.6	+3.7	+3.8	+3.9	+4.0	+4.1	+4.2	+4.3	+ 4.4	
14	-10.0	+3.2	+3.3	+3.4	+3.5	+3.6	+3.7	+3.8	+3.9	+4.0	+4.1	+ 4.2	
16	- 8.9	+3.1	+3.2	+3.3	+3.4	+3.4	+3.5	+3.6	+3.7	+3.8	+3.9	+ 4.0	
18	- 7.8	+2.9	+3.0	+3.1	+3.2	+3.3	+3.4	+3.4	+3.5	+3.6	+3.7	+ 3.8	
20	- 6.7	+2.8	+2.9	+2.9	+3.0	+3.1	+3.2	+3.3	+3.3	+3.4	+3.5	+ 3.6	
22	- 5.6	+2.6	+2.7	+2.8	+2.9	+2.9	+3.0	+3.1	+3.2	+3.2	+3.3	+ 3.4	
24	- 4.4	+2.5	+2.6	+2.6	+2.7	+2.8	+2.8	+2.9	+3.0	+3.1	+3.1	+ 3.2	
26	- 3.3	+2.3	+2.4	+2.5	+2.5	+2.6	+2.7	+2.7	+2.8	+2.9	+2.9	+ 3.0	
28	- 2.2	+2.2	+2.3	+2.3	+2.4	+2.4	+2.5	+2.6	+2.6	+2.7	+2.8	+ 2.8	
30	- 1.1	+2.0	+2.1	+2.2	+2.2	+2.3	+2.3	+2.4	+2.4	+2.5	+2.6	+ 2.6	
32	- 0.0	+1.9	+1.9	+2.0	+2.1	+2.1	+2.2	+2.2	+2.3	+2.3	+2.4	+ 2.4	
34	1.1	+1.7	+1.8	+1.8	+1.9	+1.9	+2.0	+2.0	+2.1	+2.1	+2.2	+ 2.2	
36	2.2	+1.6	+1.7	+1.7	+1.7	+1.8	+1.8	+1.9	+1.9	+2.0	+2.0	+ 2.1	
38	3.3	+1.5	+1.5	+1.5	+1.6	+1.6	+1.7	+1.7	+1.8	+1.8	+1.8	+ 1.9	
40	4.4	+1.3	+1.4	+1.4	+1.4	+1.5	+1.5	+1.5	+1.6	+1.6	+1.7	+ 1.7	

36761A

RPM Temperature Correction
Fig.516 (Sheet 3)

EFFECTIVITY: ALL

71-00-00
Page 586
Dec 15/91

8G



RB-211 Propulsion System

MAINTENANCE

OAT		OBSERVED N% RPM ON PRECISION TACHOMETER											
°F	°C	70	72	74	76	78	80	82	84	86	88	90	
42	5.6	+1.2	+1.2	+1.2	+1.3	+1.3	+1.3	+1.4	+1.4	+1.4	+1.5	+1.5	
44	6.7	+1.0	+1.1	+1.1	+1.1	+1.2	+1.2	+1.2	+1.2	+1.3	+1.3	+1.3	
46	7.8	+0.9	+0.9	+0.9	+1.0	+1.0	+1.0	+1.0	+1.1	+1.1	+1.1	+1.1	
48	8.9	+0.8	+0.8	+0.8	+0.8	+0.8	+0.9	+0.9	+0.9	+0.9	+0.9	+1.0	
50	10.0	+0.6	+0.6	+0.7	+0.7	+0.7	+0.7	+0.7	+0.7	+0.8	+0.8	+0.8	
52	11.1	+0.5	+0.5	+0.5	+0.5	+0.5	+0.5	+0.6	+0.6	+0.6	+0.6	+0.6	
54	12.2	+0.3	+0.3	+0.4	+0.4	+0.4	+0.4	+0.4	+0.4	+0.4	+0.4	+0.4	
56	13.3	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2	+0.3	+0.3	
58	14.4	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	
60	15.6	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	
62	16.7	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3	
64	17.8	-0.3	-0.3	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	
66	18.9	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.6	-0.6	-0.6	-0.6	
68	20.0	-0.6	-0.6	-0.6	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.8	-0.8	
70	21.1	-0.7	-0.8	-0.8	-0.8	-0.8	-0.8	-0.9	-0.9	-0.9	-0.9	-0.9	
72	22.2	-0.9	-0.9	-0.9	-0.9	-1.0	-1.0	-1.0	-1.0	-1.1	-1.1	-1.1	
74	23.3	-1.0	-1.0	-1.0	-1.1	-1.1	-1.1	-1.2	-1.2	-1.2	-1.2	-1.3	
76	24.4	-1.1	-1.2	-1.2	-1.2	-1.2	-1.3	-1.3	-1.3	-1.4	-1.4	-1.4	
78	25.6	-1.2	-1.3	-1.3	-1.4	-1.4	-1.4	-1.5	-1.5	-1.5	-1.6	-1.6	
80	26.7	-1.4	-1.4	-1.5	-1.5	-1.5	-1.6	-1.6	-1.6	-1.7	-1.7	-1.7	
82	27.8	-1.5	-1.5	-1.6	-1.6	-1.7	-1.7	-1.8	-1.8	-1.8	-1.9	-1.9	
84	28.9	-1.6	-1.7	-1.7	-1.8	-1.8	-1.9	-1.9	-2.0	-2.0	-2.0	-2.0	
86	30.0	-1.8	-1.8	-1.9	-1.9	-2.0	-2.0	-2.1	-2.1	-2.2	-2.2	-2.3	
88	31.1	-1.9	-1.9	-2.0	-2.0	-2.1	-2.1	-2.2	-2.3	-2.3	-2.4	-2.4	
90	32.2	-2.0	-2.1	-2.1	-2.2	-2.2	-2.3	-2.3	-2.4	-2.5	-2.5	-2.6	
92	33.3	-2.1	-2.2	-2.2	-2.3	-2.4	-2.4	-2.5	-2.5	-2.6	-2.7	-2.7	
94	34.4	-2.2	-2.3	-2.4	-2.4	-2.5	-2.6	-2.6	-2.7	-2.8	-2.8	-2.9	
96	35.6	-2.4	-2.4	-2.5	-2.6	-2.6	-2.7	-2.8	-2.8	-2.9	-3.0	-3.0	
98	36.7	-2.5	-2.6	-2.6	-2.7	-2.8	-2.8	-2.9	-3.0	-3.1	-3.1	-3.2	
100	37.8	-2.6	-2.7	-2.8	-2.8	-2.9	-3.0	-3.1	-3.1	-3.2	-3.3	-3.4	
102	38.9	-2.7	-2.8	-2.9	-3.0	-3.0	-3.1	-3.2	-3.3	-3.4	-3.4	-3.5	
104	40.0	-2.9	-2.9	-3.0	-3.1	-3.2	-3.3	-3.3	-3.4	-3.5	-3.6	-3.7	
106	41.1	-3.0	-3.1	-3.1	-3.2	-3.3	-3.4	-3.5	-3.6	-3.6	-3.7	-3.8	
108	42.2	-3.1	-3.2	-3.3	-3.4	-3.4	-3.5	-3.6	-3.7	-3.8	-3.9	-4.0	
110	43.3	-3.2	-3.3	-3.4	-3.5	-3.6	-3.7	-3.8	-3.8	-3.9	-4.0	-4.1	
112	44.4	-3.3	-3.4	-3.5	-3.6	-3.7	-3.8	-3.9	-4.0	-4.1	-4.2	-4.3	
114	45.6	-3.4	-3.5	-3.6	-3.7	-3.8	-3.9	-4.0	-4.1	-4.2	-4.3	-4.4	
116	46.7	-3.6	-3.7	-3.8	-3.9	-4.0	-4.1	-4.2	-4.3	-4.4	-4.5	-4.6	
118	47.8	-3.7	-3.8	-3.9	-4.0	-4.1	-4.2	-4.3	-4.4	-4.5	-4.6	-4.7	
120	48.9	-3.8	-3.9	-4.0	-4.1	-4.2	-4.3	-4.4	-4.5	-4.6	-4.8	-4.9	
122	50.0	-3.9	-4.0	-4.1	-4.2	-4.3	-4.5	-4.6	-4.7	-4.8	-4.9	-5.0	
124	51.1	-4.0	-4.1	-4.2	-4.4	-4.5	-4.6	-4.7	-4.8	-4.9	-5.0	-5.2	

36762A

RPM Temperature Correction
Fig.516 (Sheet 4)

C
C

R
R
050B

EFFECTIVITY: ALL

8G

71-00-00
Page 587
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

OAT		OBSERVED N% RPM ON PRECISION TACHOMETER				
°F	°C	92	94	96	98	100
-40	-40.0	+10.3	+10.5	+10.7	+10.9	+11.2
-38	-38.9	+10.0	+10.2	+10.5	+10.7	+10.9
-36	-37.8	+ 9.8	+10.0	+10.2	+10.4	+10.6
-34	-36.7	+ 9.5	+ 9.8	+10.0	+10.2	+10.4
-32	-35.6	+ 9.3	+ 9.5	+ 9.7	+ 9.9	+10.1
-30	-34.4	+ 9.1	+ 9.3	+ 9.5	+ 9.7	+ 9.9
-28	-33.3	+ 8.8	+ 9.0	+ 9.2	+ 9.4	+ 9.6
-26	-32.2	+ 8.6	+ 8.8	+ 9.0	+ 9.2	+ 9.4
-24	-31.1	+ 8.4	+ 8.6	+ 8.7	+ 8.9	+ 9.1
-22	-30.0	+ 8.1	+ 8.3	+ 8.5	+ 8.7	+ 8.9
-20	-28.9	+ 7.9	+ 8.1	+ 8.3	+ 8.4	+ 8.6
-18	-27.8	+ 7.7	+ 7.9	+ 8.0	+ 8.2	+ 8.4
-16	-26.7	+ 7.5	+ 7.6	+ 7.8	+ 8.0	+ 8.1
-14	-25.6	+ 7.2	+ 7.4	+ 7.6	+ 7.7	+ 7.9
-12	-24.4	+ 7.0	+ 7.2	+ 7.3	+ 7.5	+ 7.6
-10	-23.3	+ 6.8	+ 6.9	+ 7.1	+ 7.2	+ 7.4
- 8	-22.2	+ 6.6	+ 6.7	+ 6.9	+ 7.0	+ 7.2
- 6	-21.1	+ 6.4	+ 6.5	+ 6.6	+ 6.8	+ 6.9
- 4	-20.0	+ 6.1	+ 6.3	+ 6.4	+ 6.6	+ 6.7
- 2	-18.9	+ 5.9	+ 6.1	+ 6.2	+ 6.3	+ 6.5
- 0	-17.8	+ 5.7	+ 5.8	+ 6.0	+ 6.1	+ 6.2
2	-16.7	+ 5.5	+ 5.6	+ 5.7	+ 5.9	+ 6.0
4	-15.6	+ 5.3	+ 5.4	+ 5.5	+ 5.6	+ 5.8
6	-14.4	+ 5.1	+ 5.2	+ 5.3	+ 5.4	+ 5.5
8	-13.3	+ 4.9	+ 5.0	+ 5.1	+ 5.2	+ 5.3
10	-12.2	+ 4.7	+ 4.8	+ 4.9	+ 5.0	+ 5.1
12	-11.1	+ 4.5	+ 4.6	+ 4.7	+ 4.8	+ 4.9
14	-10.0	+ 4.3	+ 4.4	+ 4.5	+ 4.5	+ 4.6
16	- 8.9	+ 4.1	+ 4.2	+ 4.2	+ 4.3	+ 4.4
18	- 7.8	+ 3.9	+ 3.9	+ 4.0	+ 4.1	+ 4.2
20	- 6.7	+ 3.7	+ 3.7	+ 3.8	+ 3.9	+ 4.0
22	- 5.6	+ 3.5	+ 3.5	+ 3.6	+ 3.7	+ 3.8
24	- 4.4	+ 3.3	+ 3.3	+ 3.4	+ 3.5	+ 3.6
26	- 3.3	+ 3.1	+ 3.1	+ 3.2	+ 3.3	+ 3.3
28	- 2.2	+ 2.9	+ 2.9	+ 3.0	+ 3.1	+ 3.1
30	- 1.1	+ 2.7	+ 2.7	+ 2.8	+ 2.9	+ 2.9
32	- 0.0	+ 2.5	+ 2.5	+ 2.6	+ 2.7	+ 2.7
34	1.1	+ 2.3	+ 2.3	+ 2.4	+ 2.4	+ 2.6
36	2.2	+ 2.1	+ 2.2	+ 2.2	+ 2.2	+ 2.3
38	3.3	+ 1.9	+ 2.0	+ 2.0	+ 2.0	+ 2.1
40	4.4	+ 1.7	+ 1.8	+ 1.8	+ 1.8	+ 1.9

36763A

C
C

RPM Temperature Correction
Fig.516 (Sheet 5)

R EFFECTIVITY: ALL

050B

8G

71-00-00
Page 588
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

OAT		OBSERVED N% RPM ON PRECISION TACHOMETER				
°F	°C	92	94	96	98	100
42	5.6	+1.5	+1.6	+1.6	+1.6	+1.7
44	6.7	+1.4	+1.4	+1.4	+1.4	+1.5
46	7.8	+1.2	+1.2	+1.2	+1.3	+1.3
48	8.9	+1.0	+1.0	+1.0	+1.1	+1.1
50	10.0	+0.8	+0.8	+0.8	+0.9	+0.9
52	11.1	+0.6	+0.6	+0.7	+0.7	+0.7
54	12.2	+0.4	+0.5	+0.5	+0.5	+0.5
56	13.3	+0.3	+0.3	+0.3	+0.3	+0.3
58	14.4	+0.1	+0.1	+0.1	+0.1	+0.1
60	15.6	-0.1	-0.1	-0.1	-0.1	-0.1
62	16.7	-0.3	-0.3	-0.3	-0.3	-0.3
64	17.8	-0.4	-0.4	-0.5	-0.5	-0.5
66	18.9	-0.6	-0.6	-0.6	-0.7	-0.7
68	20.0	-0.8	-0.8	-0.8	-0.8	-0.9
70	21.1	-1.0	-1.0	-1.0	-1.0	-1.0
72	22.2	-1.1	-1.2	-1.2	-1.2	-1.2
74	23.3	-1.3	-1.3	-1.4	-1.4	-1.4
76	24.4	-1.5	-1.5	-1.5	-1.6	-1.6
78	25.6	-1.6	-1.7	-1.7	-1.7	-1.8
80	26.7	-1.8	-1.8	-1.9	-1.9	-2.0
82	27.8	-2.0	-2.0	-2.1	-2.1	-2.1
84	28.9	-2.1	-2.2	-2.2	-2.3	-2.3
86	30.0	-2.3	-2.4	-2.4	-2.5	-2.5
88	31.1	-2.5	-2.5	-2.6	-2.6	-2.7
90	32.2	-2.6	-2.7	-2.7	-2.8	-2.9
92	33.3	-2.8	-2.9	-2.9	-3.0	-3.0
94	34.4	-3.0	-3.0	-3.1	-3.1	-3.2
96	35.6	-3.1	-3.2	-3.2	-3.3	-3.4
98	36.7	-3.3	-3.3	-3.4	-3.5	-3.6
100	37.8	-3.4	-3.5	-3.6	-3.7	-3.7
102	38.9	-3.6	-3.7	-3.7	-3.8	-3.9
104	40.0	-3.7	-3.8	-3.9	-4.0	-4.1
106	41.1	-3.9	-4.0	-4.1	-4.2	-4.2
108	42.2	-4.1	-4.1	-4.2	-4.3	-4.4
110	43.3	-4.2	-4.3	-4.4	-4.5	-4.6
112	44.4	-4.4	-4.5	-4.6	-4.7	-4.7
114	45.6	-4.5	-4.6	-4.7	-4.8	-4.9
116	46.7	-4.7	-4.8	-4.9	-5.0	-5.1
118	47.8	-4.8	-4.9	-5.0	-5.1	-5.2
120	48.9	-5.0	-5.1	-5.2	-5.3	-5.4
122	50.0	-5.1	-5.2	-5.3	-5.5	-5.6
124	51.1	-5.3	-5.4	-5.5	-5.6	-5.7

36764A

RPM Temperature Correction
Fig.516 (Sheet 6)

EFFECTIVITY: ALL

71-00-00
Page 589
Dec 15/91

8G



RB.211 Propulsion System

MAINTENANCE

OAT		OBSERVED TGT									
°F	°C	310	320	330	340	350	360	370	380	390	
-40	-40.0	+137.4	+139.8	+142.1	+144.5	+146.8	+149.2	+151.6	+153.0	+155.3	
-38	-38.9	+134.0	+136.3	+138.6	+140.9	+143.2	+145.5	+147.8	+150.1	+152.4	
-36	-37.8	+130.6	+132.9	+135.1	+137.3	+139.6	+141.8	+144.1	+146.3	+148.5	
-34	-36.7	+127.3	+129.5	+131.8	+133.8	+136.0	+138.2	+140.4	+142.6	+144.7	
-32	-35.6	+124.0	+126.1	+128.2	+130.3	+132.5	+134.6	+136.7	+138.8	+141.0	
-30	-34.4	+120.7	+122.7	+124.8	+126.9	+128.9	+131.0	+133.1	+135.2	+137.2	
-28	-33.3	+117.4	+119.4	+121.4	+123.5	+125.5	+127.5	+129.5	+131.5	+133.5	
-26	-32.2	+114.2	+116.1	+118.1	+120.1	+122.0	+124.0	+125.9	+127.9	+129.9	
-24	-31.1	+111.0	+112.9	+114.8	+116.7	+118.6	+120.5	+122.4	+124.3	+126.2	
-22	-30.0	+107.8	+109.7	+111.5	+113.4	+115.2	+117.1	+118.9	+120.8	+122.6	
-20	-28.9	+104.7	+106.5	+108.3	+110.1	+111.9	+113.7	+115.4	+117.2	+119.0	
-18	-27.8	+101.6	+103.3	+105.0	+106.8	+108.5	+110.3	+112.0	+113.8	+115.5	
-16	-26.7	+ 98.5	+100.2	+101.9	+103.5	+105.2	+106.9	+108.6	+110.3	+112.0	
-14	-25.6	+ 95.4	+ 97.1	+ 98.7	+100.3	+102.0	+103.6	+105.2	+106.9	+108.5	
-12	-24.4	+ 92.4	+ 94.0	+ 95.6	+ 97.1	+ 98.7	+100.3	+101.9	+103.5	+105.1	
-10	-23.3	+ 89.4	+ 90.9	+ 92.5	+ 94.0	+ 95.5	+ 97.1	+ 98.6	+100.1	+101.7	
- 8	-22.2	+ 86.4	+ 87.9	+ 89.4	+ 90.9	+ 92.3	+ 93.8	+ 95.3	+ 96.8	+ 98.3	
- 6	-21.1	+ 83.5	+ 84.9	+ 86.3	+ 87.8	+ 89.2	+ 90.6	+ 92.1	+ 93.5	+ 94.9	
- 4	-20.0	+ 80.5	+ 81.9	+ 83.3	+ 84.7	+ 86.1	+ 87.5	+ 88.8	+ 90.2	+ 91.6	
- 2	-18.9	+ 77.6	+ 79.0	+ 80.3	+ 81.6	+ 83.0	+ 84.3	+ 85.6	+ 87.0	+ 88.3	
- 0	-17.8	+ 74.8	+ 76.1	+ 77.3	+ 78.6	+ 79.9	+ 81.2	+ 82.5	+ 83.8	+ 85.0	
2	-16.7	+ 71.9	+ 73.2	+ 74.4	+ 75.6	+ 76.9	+ 78.1	+ 79.3	+ 80.6	+ 81.8	
4	-15.6	+ 69.1	+ 70.3	+ 71.5	+ 72.7	+ 73.8	+ 75.0	+ 76.2	+ 77.4	+ 78.6	
6	-14.4	+ 66.3	+ 67.4	+ 68.6	+ 69.7	+ 70.9	+ 72.0	+ 73.1	+ 74.3	+ 75.4	
8	-13.3	+ 63.5	+ 64.6	+ 65.7	+ 66.8	+ 67.9	+ 69.0	+ 70.1	+ 71.2	+ 72.2	
10	-12.2	+ 60.8	+ 61.8	+ 62.9	+ 63.9	+ 65.0	+ 66.0	+ 67.0	+ 68.1	+ 69.1	
12	-11.1	+ 58.1	+ 59.0	+ 60.0	+ 61.9	+ 62.0	+ 63.0	+ 64.0	+ 65.0	+ 66.0	
14	-10.0	+ 55.3	+ 56.3	+ 57.2	+ 58.2	+ 59.1	+ 60.1	+ 61.1	+ 62.0	+ 62.9	
16	- 8.9	+ 52.7	+ 53.6	+ 54.5	+ 55.4	+ 56.3	+ 57.2	+ 58.1	+ 59.0	+ 59.9	
18	- 7.8	+ 50.0	+ 50.9	+ 51.7	+ 52.6	+ 53.4	+ 54.3	+ 55.2	+ 56.0	+ 56.9	
20	- 6.7	+ 47.4	+ 48.2	+ 49.0	+ 49.8	+ 50.6	+ 51.4	+ 52.2	+ 53.1	+ 53.9	
22	- 5.6	+ 44.8	+ 45.5	+ 46.3	+ 47.1	+ 47.8	+ 48.6	+ 49.4	+ 50.1	+ 50.9	
24	- 4.4	+ 42.2	+ 42.9	+ 43.6	+ 44.3	+ 45.1	+ 45.8	+ 46.5	+ 47.2	+ 47.9	
26	- 3.3	+ 39.6	+ 40.3	+ 40.9	+ 41.6	+ 42.3	+ 43.0	+ 43.7	+ 44.3	+ 45.0	
28	- 2.2	+ 37.0	+ 37.7	+ 38.3	+ 38.9	+ 39.6	+ 40.2	+ 40.8	+ 41.5	+ 42.1	
30	- 1.1	+ 34.5	+ 35.1	+ 35.7	+ 36.3	+ 36.9	+ 37.5	+ 38.1	+ 38.6	+ 39.2	
32	- 0	+ 32.0	+ 32.5	+ 33.1	+ 33.6	+ 34.2	+ 34.7	+ 35.3	+ 35.8	+ 36.4	
34	- 1.1	+ 29.5	+ 30.0	+ 30.5	+ 31.0	+ 31.5	+ 32.0	+ 32.5	+ 33.0	+ 33.6	
36	2.2	+ 27.0	+ 27.5	+ 28.0	+ 28.4	+ 28.9	+ 29.4	+ 29.8	+ 30.3	+ 30.7	
38	3.3	+ 24.6	+ 25.0	+ 25.4	+ 25.8	+ 26.3	+ 26.7	+ 27.1	+ 27.5	+ 28.0	

93986

HA 2388
M1-0100-71-634

TGT Temperature Correction
Fig.517 (Sheet 1 of 14)

C
C

R EFFECTIVITY: ALL

050B

8G

71-00-00
Page 590
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

OAT		OBSERVED TGT								
°F	°C	310	320	330	340	350	360	370	380	390
40	4.4	+22.2	+22.5	+22.9	+23.3	+23.7	+24.1	+24.4	+24.8	+25.2
42	5.6	+19.7	+20.1	+20.4	+20.8	+21.1	+21.4	+21.8	+22.1	+22.5
44	6.7	+17.4	+17.8	+17.9	+18.2	+18.5	+18.8	+19.1	+19.4	+19.7
46	7.8	+15.0	+15.2	+15.5	+15.7	+16.0	+16.3	+16.5	+16.8	+17.0
48	8.9	+12.6	+12.8	+13.1	+13.3	+13.5	+13.7	+13.9	+14.1	+14.4
50	10.0	+10.3	+10.5	+10.6	+10.8	+11.0	+11.2	+11.3	+11.5	+11.7
52	11.1	+ 8.0	+ 8.1	+ 8.2	+ 8.4	+ 8.5	+ 8.7	+ 8.8	+ 8.9	+ 9.1
54	12.2	+ 5.7	+ 5.8	+ 5.9	+ 6.0	+ 6.1	+ 6.2	+ 6.3	+ 6.4	+ 6.4
56	13.3	+ 3.4	+ 3.4	+ 3.5	+ 3.6	+ 3.6	+ 3.7	+ 3.7	+ 3.8	+ 3.9
58	14.4	+ 1.1	+ 1.1	+ 1.2	+ 1.2	+ 1.2	+ 1.2	+ 1.2	+ 1.3	+ 1.3
60	15.6	- 1.1	- 1.1	- 1.2	- 1.2	- 1.2	- 1.2	- 1.2	- 1.3	- 1.3
62	16.7	- 3.4	- 3.4	- 3.5	- 3.5	- 3.6	- 3.6	- 3.7	- 3.8	- 3.8
64	17.8	- 5.6	- 5.7	- 5.8	- 5.8	- 5.9	- 6.0	- 6.1	- 6.2	- 6.3
66	18.9	- 7.8	- 7.9	- 8.0	- 8.2	- 8.3	- 8.4	- 8.6	- 8.7	- 8.8
68	20.0	-12.1	-12.3	-12.5	-12.7	-12.9	-13.1	-13.3	-13.6	-13.8
70	21.1	-12.1	-12.3	-12.5	-12.7	-12.9	-13.1	-13.3	-13.6	-13.8
72	22.2	-14.2	-14.5	-14.7	-15.0	-15.2	-15.5	-15.7	-16.0	-16.2
74	23.3	-16.4	-16.7	-16.9	-17.2	-17.5	-17.8	-18.1	-18.3	-18.6
76	24.4	-18.5	-18.8	-19.1	-19.4	-19.8	-20.1	-20.4	-20.7	-21.0
78	25.6	-20.6	-20.9	-21.3	-21.6	-22.0	-22.4	-22.7	-23.1	-23.4
80	26.7	-22.7	-23.1	-23.4	-23.8	-24.2	-24.6	-25.0	-25.4	-25.8
82	27.8	-24.7	-25.2	-25.6	-26.0	-26.4	-26.9	-27.3	-27.7	-28.1
84	28.9	-26.8	-27.3	-27.7	-28.2	-28.6	-29.1	-29.5	-30.0	-30.5
86	30.0	-28.8	-29.3	-29.8	-30.3	-30.8	-31.3	-31.8	-32.3	-32.8
88	31.1	-30.9	-31.4	-31.9	-32.4	-33.0	-33.5	-34.0	-34.6	-35.1
90	32.2	-32.9	-33.4	-34.0	-34.6	-35.1	-35.7	-36.2	-36.8	-37.4
92	33.3	-34.9	-35.5	-36.0	-36.6	-37.2	-37.8	-38.4	-39.0	-39.6
94	34.4	-36.8	-37.5	-38.1	-38.7	-39.4	-40.0	-40.6	-41.3	-41.9
96	35.6	-38.8	-39.5	-40.1	-40.8	-41.5	-42.1	-42.8	-43.5	-44.1
98	36.7	-40.7	-41.4	-42.1	-42.8	-43.5	-44.2	-44.9	-45.6	-46.3
100	37.8	-42.7	-43.4	-44.1	-44.9	-45.6	-46.3	-47.1	-47.8	-48.5
102	38.9	-44.6	-45.4	-46.1	-46.9	-47.7	-48.4	-49.2	-50.0	-50.7
104	40.0	-46.5	-47.3	-48.1	-48.9	-49.7	-50.5	-51.3	-52.1	-52.9
106	41.1	-48.4	-49.2	-50.1	-50.9	-51.7	-52.6	-53.4	-54.2	-55.1
108	42.2	-50.3	-51.2	-52.0	-52.9	-53.7	-54.6	-55.5	-56.3	-57.2
110	43.3	-52.2	-53.1	-54.0	-54.8	-55.7	-56.6	-57.5	-58.4	-59.3
112	44.4	-54.0	-54.9	-55.9	-56.8	-57.7	-58.7	-59.6	-60.5	-61.4
114	45.6	-55.9	-56.8	-57.8	-58.7	-59.7	-60.7	-61.6	-62.6	-63.5
116	46.7	-57.7	-58.7	-59.7	-60.7	-61.7	-62.6	-63.6	-64.6	-65.6
118	47.8	-59.5	-60.5	-61.6	-62.6	-63.6	-64.6	-65.6	-66.7	-67.7
120	48.9	-61.3	-62.4	-63.4	-64.5	-65.5	-66.6	-67.6	-68.7	-69.7
122	50.0	-63.1	-64.2	-65.3	-66.4	-67.4	-68.5	-69.6	-70.7	-71.8
124	51.1	-64.9	-66.0	-67.1	-68.2	-69.3	-70.5	-71.6	-72.7	-73.8

93986

HA 2387

M1-0100-71-535

TGT Temperature Correction
Fig.517 (Sheet 2 of 14)

C
CR EFFECTIVITY: ALL
R
050B

8G

71-00-00
Page 591
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

OAT		OBSERVED TGT								
°F	°C	400	410	420	430	440	450	460	470	480
-40	-40.0	+158.6	+161.0	+163.3	+165.7	+168.1	+170.4	+172.8	+175.1	+177.5
-38	-38.9	+154.7	+157.0	+159.3	+161.6	+163.9	+166.2	+168.5	+170.8	+173.1
-36	-37.8	+150.8	+153.0	+155.3	+157.5	+159.8	+162.0	+164.2	+166.5	+168.7
-34	-36.7	+146.9	+149.1	+151.3	+153.5	+155.7	+157.8	+160.0	+162.2	+164.4
-32	-35.6	+143.1	+145.2	+147.3	+149.5	+151.6	+153.7	+155.8	+158.0	+160.1
-30	-34.4	+139.3	+141.4	+143.4	+145.5	+147.6	+149.6	+151.7	+153.8	+155.9
-28	-33.3	+135.5	+137.5	+139.6	+141.6	+143.6	+145.6	+147.6	+149.6	+151.6
-26	-32.2	+131.8	+133.8	+135.7	+137.7	+139.6	+141.6	+143.6	+145.5	+147.5
-24	-31.1	+128.1	+130.0	+131.9	+133.8	+135.7	+137.6	+139.5	+141.4	+143.3
-22	-30.0	+124.5	+126.3	+128.2	+130.0	+131.9	+133.7	+135.6	+137.4	+139.3
-20	-28.9	+120.8	+122.6	+124.4	+126.2	+128.0	+129.8	+131.6	+133.4	+135.2
-18	-27.8	+117.2	+119.0	+120.7	+122.5	+124.2	+126.0	+127.7	+129.4	+131.2
-16	-26.7	+113.7	+115.4	+117.1	+118.8	+120.4	+122.1	+123.8	+125.5	+127.2
-14	-25.6	+110.2	+111.8	+113.4	+115.1	+116.7	+118.3	+120.0	+121.6	+123.2
-12	-24.4	+106.7	+108.2	+109.8	+111.4	+113.0	+114.6	+116.2	+117.8	+119.3
-10	-23.3	+103.2	+104.7	+106.3	+107.8	+109.3	+110.9	+112.4	+113.9	+115.5
-8	-22.2	+99.8	+101.2	+102.7	+104.2	+105.7	+107.2	+108.7	+110.1	+111.6
-6	-21.1	+96.4	+97.8	+99.2	+100.6	+102.1	+103.5	+104.9	+106.4	+107.8
-4	-20.0	+93.0	+94.4	+95.7	+97.1	+98.5	+99.9	+101.3	+102.7	+104.0
-2	-18.9	+89.6	+91.0	+92.3	+93.6	+95.0	+96.3	+97.6	+99.0	+100.3
0	-17.8	+86.3	+87.6	+88.9	+90.2	+91.5	+92.7	+94.0	+95.3	+96.6
2	-16.7	+83.0	+84.3	+85.5	+86.7	+88.0	+89.2	+90.4	+91.7	+92.9
4	-15.6	+79.8	+81.0	+82.1	+83.3	+84.5	+85.7	+86.9	+88.1	+89.3
6	-14.4	+76.5	+77.7	+78.8	+80.0	+81.1	+82.2	+83.4	+84.5	+85.6
8	-13.3	+73.3	+74.4	+75.5	+76.6	+77.7	+78.8	+79.9	+81.0	+82.1
10	-12.2	+70.2	+71.2	+72.2	+73.3	+74.3	+75.4	+76.4	+77.5	+78.5
12	-11.1	+67.0	+68.0	+69.0	+70.0	+71.0	+72.0	+73.0	+74.0	+75.0
14	-10.0	+63.0	+64.8	+65.8	+66.7	+67.7	+68.6	+69.6	+70.5	+71.5
16	-8.9	+60.8	+61.7	+62.6	+63.5	+64.4	+65.4	+66.2	+67.1	+68.0
18	-7.8	+57.7	+58.6	+59.4	+60.3	+61.2	+62.0	+62.9	+63.7	+64.6
20	-6.7	+54.7	+55.5	+56.3	+57.1	+57.9	+58.7	+59.6	+60.4	+61.2
22	-5.6	+51.7	+52.4	+53.2	+54.0	+54.7	+55.5	+56.3	+57.0	+57.8
24	-4.4	+48.7	+49.4	+50.1	+50.8	+51.6	+52.3	+53.0	+53.7	+54.5
26	-3.3	+45.7	+46.4	+47.1	+47.7	+48.3	+49.1	+49.8	+50.5	+51.1
28	-2.2	+42.8	+43.4	+44.0	+44.7	+45.3	+45.9	+46.6	+47.2	+47.8
30	-1.1	+49.8	+40.4	+41.0	+41.6	+42.2	+42.8	+43.4	+44.0	+44.6
32	0	+36.9	+37.5	+38.0	+38.6	+39.1	+39.7	+40.2	+40.8	+41.3
34	1.1	+34.1	+34.6	+35.1	+35.6	+36.1	+36.6	+37.1	+37.6	+38.1
36	2.2	+31.2	+31.7	+32.1	+32.6	+33.1	+33.5	+34.0	+34.5	+34.9
38	3.3	+28.4	+28.8	+29.2	+29.6	+30.1	+30.5	+30.9	+31.3	+31.8
40	4.4	+25.6	+26.0	+26.3	+26.7	+27.1	+27.5	+27.9	+28.2	+28.6

93987

HA 2388

M1-0100-71-536

C
C

TGT Temperature Correction
Fig.517 (Sheet 3 of 14)

R EFFECTIVITY: ALL

050B

71-00-00

Page 592
Dec 15/91

8G



RB.211 Propulsion System

MAINTENANCE

OAT		OBSERVED TGT									
°F	°C	400	410	420	430	440	450	460	470	480	
42	5.6	+ 22.8	+ 23.1	+ 23.4	+ 23.8	+ 24.1	+ 24.5	+ 24.8	+ 25.2	+ 25.5	
44	6.7	+ 20.0	+ 20.3	+ 20.6	+ 20.9	+ 21.2	+ 21.5	+ 21.8	+ 22.1	+ 22.4	
46	7.8	+ 17.3	+ 17.5	+ 17.8	+ 18.1	+ 18.3	+ 18.6	+ 18.8	+ 19.1	+ 19.3	
48	8.9	+ 14.6	+ 14.8	+ 15.0	+ 15.2	+ 15.4	+ 15.7	+ 15.9	+ 16.1	+ 16.3	
50	10.0	+ 11.9	+ 12.1	+ 12.2	+ 12.4	+ 12.6	+ 12.8	+ 12.9	+ 13.1	+ 13.3	
52	11.1	+ 9.2	+ 9.3	+ 9.5	+ 9.6	+ 9.7	+ 9.9	+ 10.0	+ 10.2	+ 10.3	
54	12.2	+ 6.5	+ 6.6	+ 6.7	+ 6.8	+ 6.9	+ 7.0	+ 7.1	+ 7.2	+ 7.3	
56	13.3	+ 3.9	+ 4.0	+ 4.0	+ 4.1	+ 4.1	+ 4.2	+ 4.3	+ 4.3	+ 4.4	
58	14.4	+ 1.3	+ 1.3	+ 1.3	+ 1.4	+ 1.4	+ 1.4	+ 1.4	+ 1.4	+ 1.5	
60	15.6	- 1.3	- 1.3	- 1.3	- 1.4	- 1.4	- 1.4	- 1.4	- 1.4	- 1.4	
62	16.7	- 3.9	- 3.9	- 4.0	- 4.0	- 4.1	- 4.2	- 4.2	- 4.3	- 4.3	
64	17.8	- 6.4	- 6.5	- 6.6	- 6.7	- 6.8	- 6.9	- 7.0	- 7.1	- 7.2	
66	18.9	- 9.0	- 9.1	- 9.2	- 9.4	- 9.5	- 9.6	- 9.8	- 9.9	- 10.0	
68	20.0	- 11.5	- 11.6	- 11.8	- 12.0	- 12.2	- 12.3	- 12.5	- 12.7	- 12.8	
70	21.1	- 14.0	- 14.2	- 14.4	- 14.6	- 14.8	- 15.0	- 15.2	- 15.4	- 15.6	
72	22.2	- 16.4	- 16.7	- 16.9	- 17.2	- 17.4	- 17.7	- 17.9	- 18.2	- 18.4	
74	23.3	- 18.9	- 19.2	- 19.5	- 19.7	- 20.0	- 20.3	- 20.6	- 20.9	- 21.2	
76	24.4	- 21.3	- 21.7	- 22.0	- 22.3	- 22.6	- 22.9	- 23.2	- 23.6	- 23.9	
78	25.6	- 23.8	- 24.1	- 24.5	- 24.8	- 25.2	- 25.5	- 25.9	- 26.2	- 26.6	
80	26.7	- 26.2	- 26.6	- 26.9	- 27.3	- 27.7	- 28.1	- 28.5	- 28.9	- 29.3	
82	27.8	- 28.6	- 29.0	- 29.4	- 29.8	- 30.3	- 30.7	- 31.1	- 31.5	- 32.0	
84	28.9	- 30.9	- 31.4	- 31.8	- 32.3	- 32.7	- 33.2	- 33.7	- 34.1	- 34.6	
86	30.0	- 33.3	- 33.8	- 34.3	- 34.8	- 35.3	- 35.8	- 36.2	- 36.7	- 37.2	
88	31.1	- 35.6	- 36.1	- 36.7	- 37.2	- 37.7	- 38.3	- 38.8	- 39.3	- 39.8	
90	32.2	- 37.9	- 38.5	- 39.1	- 39.6	- 40.2	- 40.8	- 41.3	- 41.9	- 42.4	
92	33.3	- 40.2	- 40.8	- 41.4	- 42.0	- 42.6	- 43.2	- 43.8	- 44.4	- 45.0	
94	34.4	- 42.5	- 43.1	- 43.8	- 44.4	- 45.0	- 45.7	- 46.3	- 46.9	- 47.6	
96	35.6	- 44.8	- 45.5	- 46.1	- 46.8	- 47.4	- 48.1	- 48.8	- 49.4	- 50.1	
98	36.7	- 47.0	- 47.7	- 48.4	- 49.1	- 49.8	- 50.5	- 51.2	- 51.9	- 52.6	
100	37.8	- 49.3	- 50.0	- 50.7	- 51.5	- 52.2	- 52.9	- 53.7	- 54.4	- 55.1	
102	38.9	- 51.5	- 52.3	- 53.0	- 53.8	- 54.6	- 55.3	- 56.1	- 56.8	- 57.6	
104	40.0	- 53.7	- 54.5	- 55.3	- 56.1	- 56.9	- 57.7	- 58.5	- 59.3	- 60.1	
106	41.1	- 55.9	- 56.7	- 57.5	- 58.4	- 59.2	- 60.0	- 60.9	- 61.7	- 62.5	
108	42.2	- 58.1	- 58.9	- 59.8	- 60.6	- 61.5	- 62.4	- 63.2	- 64.1	- 65.0	
110	43.3	- 60.2	- 61.1	- 62.0	- 62.9	- 63.8	- 64.7	- 65.6	- 66.5	- 67.4	
112	44.4	- 62.4	- 63.3	- 64.2	- 65.1	- 66.1	- 67.0	- 67.9	- 68.8	- 69.8	
114	45.6	- 64.5	- 65.4	- 66.4	- 67.4	- 68.3	- 69.3	- 70.2	- 71.2	- 72.2	
116	46.7	- 66.6	- 67.6	- 68.6	- 69.6	- 70.6	- 71.5	- 72.5	- 73.5	- 74.5	
118	47.8	- 68.7	- 69.7	- 70.7	- 71.8	- 72.8	- 73.8	- 74.8	- 75.8	- 76.9	
120	48.9	- 70.8	- 71.8	- 72.9	- 73.9	- 75.0	- 76.0	- 77.1	- 78.1	- 79.2	
122	50.0	- 72.9	- 73.9	- 75.0	- 76.1	- 77.2	- 78.3	- 79.3	- 80.4	- 81.5	
124	51.1	- 74.9	- 76.0	- 77.1	- 78.2	- 79.4	- 80.5	- 81.6	- 82.7	- 83.8	

93988 HA 2380
M1 0100 71-537

TGT Temperature Correction
Fig.517 (Sheet 4 of 14)

C
C

R
R
050B

EFFECTIVITY: ALL

8G

71-00-00
Page 593
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

OAT		OBSERVED TGT									
°F	°C	490	500	510	520	530	540	550	560	570	
-40	-40.0	+179.8	+182.2	+184.6	+186.9	+189.3	+191.6	+194.0	+196.3	+198.7	
-38	-38.9	+175.4	+177.7	+180.0	+182.3	+184.6	+186.9	+189.2	+191.5	+193.8	
-36	-37.8	+171.0	+173.2	+175.4	+177.7	+179.9	+182.2	+184.4	+186.6	+188.9	
-34	-36.7	+166.6	+168.8	+170.9	+173.1	+175.3	+177.5	+179.7	+181.9	+184.0	
-32	-35.6	+162.2	+164.4	+166.5	+168.6	+170.7	+172.9	+175.0	+177.1	+179.2	
-30	-34.4	+157.9	+160.0	+162.1	+164.1	+166.2	+168.3	+170.3	+172.4	+174.5	
-28	-33.3	+153.7	+155.7	+157.7	+159.7	+161.7	+163.7	+165.7	+167.8	+169.8	
-26	-32.2	+149.4	+151.4	+153.4	+155.3	+157.3	+159.2	+161.2	+163.1	+165.1	
-24	-31.1	+145.3	+147.2	+149.1	+151.0	+152.9	+154.8	+156.7	+158.6	+160.5	
-22	-30.0	+141.1	+143.0	+144.8	+146.7	+148.5	+150.3	+152.2	+154.0	+155.9	
-20	-28.9	+137.0	+138.8	+140.6	+142.4	+144.2	+146.0	+147.8	+149.6	+151.4	
-18	-27.8	+132.9	+134.7	+136.4	+138.1	+139.9	+141.6	+143.4	+145.1	+146.9	
-16	-26.7	+128.9	+130.6	+132.3	+134.0	+135.6	+137.3	+139.0	+140.7	+142.4	
-14	-25.6	+124.9	+126.5	+128.2	+129.8	+131.4	+133.1	+134.7	+136.3	+138.0	
-12	-24.4	+120.9	+122.5	+124.1	+125.7	+127.3	+128.8	+130.4	+132.0	+133.6	
-10	-23.3	+117.0	+118.5	+120.1	+121.6	+123.1	+124.7	+126.2	+127.7	+129.3	
-8	-22.2	+113.1	+114.6	+116.1	+117.5	+119.0	+120.5	+122.0	+123.5	+125.0	
-6	-21.1	+109.2	+110.7	+112.1	+113.5	+115.0	+116.4	+117.8	+119.3	+120.7	
-4	-20.0	+105.4	+106.8	+108.2	+109.6	+110.9	+112.3	+113.7	+115.1	+116.5	
-2	-18.9	+101.6	+103.0	+104.3	+105.6	+106.9	+108.3	+109.6	+110.9	+112.3	
0	-17.8	+97.9	+99.1	+100.4	+101.7	+103.0	+104.3	+105.6	+106.8	+108.1	
2	-16.7	+94.1	+95.4	+96.6	+97.8	+99.1	+100.3	+101.5	+102.8	+104.0	
4	-15.6	+90.4	+91.6	+92.8	+94.0	+95.2	+96.4	+97.6	+98.7	+99.9	
6	-14.4	+86.8	+87.9	+89.1	+90.2	+91.3	+92.5	+93.6	+94.7	+95.9	
8	-13.3	+83.1	+84.2	+85.3	+86.4	+87.5	+88.6	+89.7	+90.8	+91.9	
10	-12.2	+79.5	+80.6	+81.6	+82.7	+83.7	+84.8	+85.8	+86.8	+87.9	
12	-11.1	+76.0	+77.0	+78.0	+79.0	+80.0	+81.0	+82.0	+82.9	+83.9	
14	-10.0	+72.4	+73.4	+74.3	+75.3	+76.2	+77.2	+78.1	+79.1	+80.0	
16	-8.9	+68.9	+69.8	+70.7	+71.6	+72.5	+73.4	+74.3	+75.2	+76.2	
18	-7.8	+65.4	+66.3	+67.2	+68.0	+68.9	+69.7	+70.6	+71.4	+72.3	
20	-6.7	+62.0	+62.8	+63.6	+64.4	+65.2	+66.1	+66.9	+67.7	+68.5	
22	-5.6	+58.6	+59.3	+60.1	+60.9	+61.6	+62.4	+63.2	+63.9	+64.7	
24	-4.4	+55.2	+55.9	+56.6	+57.3	+58.1	+58.8	+59.5	+60.2	+61.0	
26	-3.3	+51.8	+52.5	+53.2	+53.8	+54.5	+55.2	+55.9	+56.6	+57.2	
28	-2.2	+48.5	+49.1	+49.7	+50.4	+51.0	+51.6	+52.3	+52.9	+53.6	
30	-1.1	+45.2	+45.7	+46.3	+46.9	+47.5	+48.1	+48.7	+49.3	+49.9	
32	0.0	+41.9	+42.4	+43.0	+43.5	+44.1	+44.6	+45.2	+45.7	+46.3	
34	1.1	+38.6	+39.1	+39.6	+40.1	+40.6	+41.1	+41.6	+42.2	+42.7	
36	2.2	+35.4	+35.8	+36.3	+36.8	+37.2	+37.7	+38.2	+38.6	+39.1	
38	3.3	+32.2	+32.6	+33.0	+33.4	+33.9	+34.3	+34.7	+35.1	+35.5	
40	4.4	+29.0	+29.4	+29.8	+30.1	+30.5	+30.9	+31.3	+31.7	+32.0	

36769

HA 2370
M1-0100-71-538

TGT Temperature Correction Fig.517 (Sheet 5 of 14)

C
C
R
R
050B

EFFECTIVITY: ALL

8G

71-00-00
Page 594
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

OAT		OBSERVED TGT								
°F	°C	490	500	510	520	530	540	550	560	570
42	5.6	+25.8	+26.2	+26.5	+26.9	+27.2	+27.5	+27.9	+28.2	+28.5
44	6.7	+22.7	+23.0	+23.3	+23.6	+23.9	+24.2	+24.5	+24.8	+25.1
46	7.8	+19.6	+19.9	+20.1	+20.4	+20.6	+20.9	+21.1	+21.4	+21.7
48	8.9	+16.5	+16.7	+17.0	+17.2	+17.4	+17.6	+17.8	+18.0	+18.3
50	10.0	+13.5	+13.6	+13.8	+14.0	+14.2	+14.3	+14.5	+14.7	+14.9
52	11.1	+10.4	+10.6	+10.7	+10.8	+11.0	+11.1	+11.3	+11.4	+11.5
54	12.2	+ 7.4	+ 7.5	+ 7.6	+ 7.7	+ 7.8	+ 7.9	+ 8.0	+ 8.1	+ 8.2
56	13.3	+ 4.4	+ 4.5	+ 4.6	+ 4.6	+ 4.7	+ 4.7	+ 4.8	+ 4.8	+ 4.9
58	14.4	+ 1.5	+ 1.5	+ 1.5	+ 1.5	+ 1.6	+ 1.6	+ 1.6	+ 1.6	+ 1.6
60	15.6	- 1.5	- 1.5	- 1.5	- 1.5	- 1.5	- 1.6	- 1.6	- 1.6	- 1.6
62	16.7	- 4.4	- 4.4	- 4.5	- 4.6	- 4.6	- 4.7	- 4.7	- 4.8	- 4.8
64	17.8	- 7.3	- 7.4	- 7.5	- 7.6	- 7.7	- 7.8	- 7.9	- 7.9	- 8.0
66	18.9	-10.2	-10.3	-10.4	-10.6	-10.7	-10.8	-11.0	-11.1	-11.2
68	20.0	-13.0	-13.2	-13.3	-13.5	-13.7	-13.9	-14.0	-14.2	-14.4
70	21.1	-15.8	-16.0	-16.3	-16.5	-16.7	-16.9	-17.1	-17.3	-17.5
72	22.2	-18.6	-18.9	-19.1	-19.4	-19.6	-19.9	-20.1	-20.4	-20.6
74	23.3	-21.4	-21.7	-22.0	-22.3	-22.6	-22.8	-23.1	-23.4	-23.7
76	24.4	-24.2	-24.5	-24.8	-25.2	-25.5	-25.8	-26.1	-26.4	-26.7
78	25.6	-26.9	-27.3	-27.7	-28.0	-28.4	-28.7	-29.1	-29.4	-29.8
80	26.7	-29.7	-30.1	-30.4	-30.8	-31.2	-31.6	-32.0	-32.4	-32.8
82	27.8	-32.4	-32.8	-33.2	-33.7	-34.1	-34.5	-34.9	-35.3	-35.8
84	28.9	-35.1	-35.5	-36.0	-36.4	-36.9	-37.4	-37.8	-38.3	-38.7
86	30.0	-37.7	-38.2	-38.7	-39.2	-39.7	-40.2	-40.7	-41.2	-41.7
88	31.1	-40.4	-40.9	-41.4	-42.0	-42.5	-43.0	-43.6	-44.1	-44.6
90	32.2	-43.0	-43.6	-44.1	-44.7	-45.3	-45.8	-46.4	-47.0	-47.5
92	33.3	-45.6	-46.2	-46.8	-47.4	-48.0	-48.6	-49.2	-49.8	-50.4
94	34.4	-48.2	-48.8	-49.5	-50.1	-50.7	-51.4	-52.0	-52.6	-53.3
96	35.6	-50.8	-51.4	-52.1	-52.8	-53.4	-54.1	-54.8	-55.4	-56.1
98	36.7	-53.3	-54.0	-54.7	-55.4	-56.1	-56.8	-57.5	-58.2	-58.9
100	37.8	-55.9	-56.6	-57.3	-58.1	-58.8	-59.5	-60.3	-61.0	-61.7
102	38.9	-58.4	-59.1	-59.9	-60.7	-61.4	-62.2	-63.0	-63.7	-64.5
104	40.0	-60.9	-61.7	-62.5	-63.3	-64.1	-64.9	-65.7	-66.5	-67.3
106	41.1	-63.4	-64.2	-65.0	-65.8	-66.7	-67.5	-68.3	-69.2	-70.0
108	42.2	-65.8	-66.7	-67.5	-68.4	-69.3	-70.1	-71.0	-71.9	-72.7
110	43.3	-68.3	-69.2	-70.1	-71.0	-71.8	-72.7	-73.6	-74.5	-75.4
112	44.4	-70.7	-71.6	-72.6	-73.5	-74.4	-75.3	-76.3	-77.2	-78.1
114	45.6	-73.1	-74.1	-75.0	-76.0	-76.9	-77.9	-78.9	-79.8	-80.8
116	46.7	-75.5	-76.5	-77.5	-78.5	-79.5	-80.5	-81.4	-82.4	-83.4
118	47.8	-77.9	-78.9	-79.9	-80.9	-82.0	-83.0	-84.0	-85.0	-86.1
120	48.9	-80.2	-81.3	-82.3	-83.4	-84.5	-85.5	-86.6	-87.6	-88.7
122	50.0	-82.6	-83.7	-84.8	-85.8	-86.9	-88.0	-89.1	-90.2	-91.3
124	51.1	-84.9	-86.0	-87.1	-88.3	-89.4	-90.5	-91.6	-92.7	-93.8

93989

HA 2371
M1 0100 71 530

TGT Temperature Correction
Fig.517 (Sheet 6 of 14)

C
C

R
R
050B

EFFECTIVITY: ALL

8G

71-00-00
Page 595
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

OAT		OBSERVED TGT									
°F	°C	580	590	600	610	620	630	640	650	660	
-40	-40.0	+201.1	+203.4	+205.8	+208.1	+210.5	+212.8	+215.2	+217.8	+219.9	
-38	-38.9	+196.1	+198.4	+200.7	+203.0	+205.3	+207.6	+209.9	+212.2	+214.5	
-36	-37.8	+191.1	+193.4	+195.6	+197.8	+200.1	+202.3	+204.6	+206.8	+209.0	
-34	-36.7	+186.2	+188.4	+190.6	+192.8	+195.0	+197.1	+199.3	+201.5	+203.7	
-32	-35.6	+181.4	+183.5	+185.6	+187.7	+189.9	+192.0	+194.1	+196.2	+198.4	
-30	-34.4	+176.6	+178.6	+180.7	+182.8	+184.8	+186.9	+189.0	+191.0	+193.1	
-28	-33.3	+171.8	+173.8	+175.8	+177.8	+179.9	+181.9	+183.9	+185.9	+187.9	
-26	-32.2	+167.1	+169.0	+171.0	+172.9	+174.9	+176.9	+178.8	+180.8	+182.7	
-24	-31.1	+162.4	+164.3	+166.2	+168.1	+170.0	+171.9	+173.8	+175.7	+177.6	
-22	-30.0	+157.7	+159.6	+161.4	+163.3	+165.1	+167.0	+168.8	+170.7	+172.5	
-20	-28.9	+153.2	+154.9	+156.7	+158.5	+160.3	+162.1	+163.9	+165.7	+167.5	
-18	-27.8	+148.6	+150.3	+152.1	+153.8	+155.6	+157.3	+159.1	+160.8	+162.5	
-16	-26.7	+144.1	+145.8	+147.5	+149.2	+150.8	+152.5	+154.2	+155.9	+157.6	
-14	-25.6	+139.6	+141.3	+142.9	+144.5	+146.2	+147.8	+149.4	+151.1	+152.7	
-12	-24.4	+135.2	+136.8	+138.4	+139.9	+141.5	+143.1	+144.7	+146.3	+147.9	
-10	-23.3	+130.8	+132.3	+133.9	+135.4	+136.9	+138.5	+140.0	+141.5	+143.1	
-8	-22.2	+126.4	+127.9	+129.4	+130.9	+132.4	+133.9	+135.3	+136.8	+138.3	
-6	-21.1	+122.1	+123.6	+125.0	+126.4	+127.9	+129.3	+130.7	+132.1	+133.6	
-4	-20.0	+117.8	+119.2	+120.6	+122.0	+123.4	+124.8	+126.1	+127.5	+128.9	
-2	-18.9	+113.6	+114.9	+116.3	+117.6	+118.9	+120.3	+121.6	+122.9	+124.3	
0	-17.8	+109.4	+110.7	+112.0	+113.3	+114.5	+115.8	+117.1	+118.4	+119.7	
2	-16.7	+105.2	+106.5	+107.7	+108.9	+110.2	+111.4	+112.6	+113.9	+115.1	
4	-15.6	+101.1	+102.3	+103.5	+104.7	+105.9	+107.0	+108.2	+109.4	+110.6	
6	-14.4	+97.0	+98.2	+99.3	+100.4	+101.6	+102.7	+103.8	+105.0	+106.1	
8	-13.3	+93.0	+94.0	+95.1	+96.2	+97.3	+98.4	+99.5	+100.6	+101.7	
10	-12.2	+88.9	+90.0	+91.0	+92.1	+93.1	+94.1	+95.2	+96.2	+97.3	
12	-11.1	+84.9	+85.9	+86.9	+87.9	+88.9	+89.9	+90.9	+91.9	+92.9	
14	-10.0	+81.0	+81.9	+82.9	+83.8	+84.8	+85.7	+86.7	+87.6	+88.6	
16	-8.9	+77.1	+78.0	+78.9	+79.8	+80.7	+81.6	+82.5	+83.4	+84.3	
18	-7.8	+73.2	+74.0	+74.9	+75.7	+76.6	+77.5	+78.3	+79.2	+80.0	
20	-6.7	+69.3	+70.1	+70.9	+71.7	+72.6	+73.4	+74.2	+75.0	+75.8	
22	-5.6	+65.5	+66.2	+67.0	+67.8	+68.5	+69.3	+70.1	+70.9	+71.6	
24	-4.4	+61.7	+62.4	+63.1	+63.9	+64.6	+65.3	+66.0	+66.7	+67.5	
26	-3.3	+57.9	+58.6	+59.3	+60.0	+60.6	+61.3	+62.0	+62.7	+63.4	
28	-2.2	+54.2	+54.8	+55.5	+56.1	+56.7	+57.4	+58.0	+58.6	+59.3	
30	-1.1	+50.5	+51.1	+51.7	+52.3	+52.9	+53.4	+54.0	+54.6	+55.2	
32	0.0	+46.8	+47.4	+47.9	+48.5	+49.0	+49.6	+50.1	+50.7	+51.2	
34	1.1	+43.2	+43.7	+44.2	+44.7	+45.2	+45.7	+46.2	+46.7	+47.2	
36	2.2	+39.6	+40.0	+40.5	+40.9	+41.4	+41.9	+42.3	+42.8	+43.3	
38	3.3	+36.0	+36.4	+36.8	+37.2	+37.7	+38.1	+38.5	+38.9	+39.3	
40	4.4	+32.4	+32.8	+33.2	+33.6	+33.9	+34.3	+34.7	+35.1	+35.5	

93990

HA 2372
M1 0100-71-540

TGT Temperature Correction
Fig.517 (Sheet 7 of 14)

C
C

R
R
050B

EFFECTIVITY: ALL

71-00-00
Page 596
Dec 15/91

8G



RB.211 Propulsion System

MAINTENANCE

OAT		OBSERVED TGT								
°F	°C	580	590	600	610	620	630	640	650	660
42	5.6	+28.9	+29.2	+29.6	+29.9	+30.2	+30.6	+30.9	+31.3	+31.6
44	6.7	+25.4	+25.7	+26.0	+26.3	+26.6	+26.9	+27.2	+27.5	+27.8
46	7.8	+21.9	+22.2	+22.4	+22.7	+22.9	+23.2	+23.5	+23.7	+24.0
48	8.9	+18.5	+18.7	+19.9	+19.1	+19.3	+19.6	+19.8	+20.0	+20.2
50	10.0	+15.1	+15.2	+15.4	+15.6	+15.8	+15.9	+16.1	+16.3	+16.5
52	11.1	+11.7	+11.8	+11.9	+12.1	+12.2	+12.3	+12.5	+12.6	+12.8
54	12.2	+ 8.3	+ 8.4	+ 8.5	+ 8.6	+ 8.7	+ 8.8	+ 8.9	+ 9.0	+ 9.1
56	13.3	+ 5.0	+ 5.0	+ 5.1	+ 5.1	+ 5.2	+ 5.2	+ 5.3	+ 5.4	+ 5.4
58	14.4	+ 1.6	+ 1.7	+ 1.7	+ 1.7	+ 1.7	+ 1.7	+ 1.8	+ 1.8	+ 1.8
60	15.6	- 1.6	- 1.7	- 1.7	- 1.7	- 1.7	- 1.7	- 1.8	- 1.8	- 1.8
62	16.7	- 4.9	- 5.0	- 5.0	- 5.1	- 5.1	- 5.2	- 5.2	- 5.3	- 5.4
64	17.8	- 8.1	- 8.2	- 8.3	- 8.4	- 8.5	- 8.6	- 8.7	- 8.8	- 8.9
66	18.9	-11.4	-11.5	-11.6	-11.8	-11.9	-12.0	-12.2	-12.3	-12.4
68	20.0	-14.5	-14.7	-14.9	-15.1	-15.2	-15.4	-15.6	-15.7	-15.9
70	21.1	-17.7	-17.9	-18.1	-18.3	-18.5	-18.7	-18.9	-19.2	-19.4
72	22.2	-20.8	-21.1	-21.3	-21.6	-21.8	-22.1	-22.3	-22.6	-22.8
74	23.3	-24.0	-24.2	-24.5	-24.8	-25.1	-25.4	-25.6	-25.9	-26.2
76	24.4	-27.1	-27.4	-27.7	-28.0	-28.3	-28.6	-29.0	-29.3	-29.6
78	25.6	-30.1	-30.5	-30.8	-31.2	-31.5	-31.9	-32.2	-32.6	-32.4
80	26.7	-33.2	-33.6	-33.9	-34.3	-34.7	-35.1	-35.5	-35.9	-36.3
82	27.8	-36.2	-36.6	-37.0	-37.5	-37.9	-38.3	-38.7	-39.2	-39.6
84	28.9	-39.2	-39.7	-40.1	-40.6	-41.0	-41.5	-42.0	-42.4	-42.9
86	30.0	-42.2	-42.7	-43.2	-43.7	-44.2	-44.7	-45.1	-45.6	-46.1
88	31.1	-45.1	-45.7	-46.2	-46.7	-47.3	-47.8	-48.3	-48.8	-49.4
90	32.2	-48.1	-48.6	-49.2	-49.8	-50.3	-50.9	-51.5	-52.0	-52.6
92	33.3	-51.0	-51.6	-52.2	-52.8	-53.4	-54.0	-54.6	-55.2	-55.8
94	34.4	-53.9	-54.5	-55.2	-55.8	-56.4	-57.0	-57.7	-58.3	-58.9
96	35.6	-56.8	-57.4	-58.1	-58.8	-59.4	-60.1	-60.8	-61.4	-62.1
98	36.7	-59.6	-60.3	-61.0	-61.7	-62.4	-63.1	-63.8	-64.5	-65.2
100	37.8	-62.5	-63.2	-63.9	-64.6	-65.4	-66.1	-66.8	-67.6	-68.3
102	38.9	-65.3	-66.0	-66.8	-67.6	-68.3	-69.1	-69.9	-70.6	-71.4
104	40.0	-68.1	-68.9	-69.7	-70.5	-71.2	-72.0	-72.8	-73.6	-74.4
106	41.1	-70.8	-71.7	-72.5	-73.3	-74.2	-75.0	-75.8	-76.6	-77.5
108	42.2	-73.6	-74.4	-75.3	-76.2	-77.0	-77.9	-78.8	-79.6	-80.5
110	43.3	-76.3	-77.2	-78.1	-79.0	-79.9	-80.8	-81.7	-82.6	-83.5
112	44.4	-79.0	-80.0	-80.9	-81.8	-82.7	-83.7	-84.6	-85.5	-86.4
114	45.6	-81.7	-82.7	-83.6	-84.6	-85.6	-86.5	-87.5	-88.4	-89.4
116	46.7	-84.4	-85.4	-86.4	-87.4	-88.4	-89.4	-90.3	-91.3	-92.3
118	47.8	-87.1	-88.1	-89.1	-90.1	-91.2	-92.2	-93.2	-94.2	-95.2
120	48.9	-89.7	-90.8	-91.8	-92.9	-93.9	-95.0	-96.0	-97.1	-98.1
122	50.0	-92.3	-93.4	-94.5	-95.6	-96.7	-97.7	-98.6	-99.9	-101.0
124	51.1	-94.9	-96.1	-97.2	-98.3	-99.4	-100.5	-101.6	-102.7	-103.8

93991

HA 2373

M1-0100-71-541

TGT Temperature Correction
Fig.517 (Sheet 8 of 14)

C
C

R EFFECTIVITY: ALL

050B

8G

71-00-00

Page 597
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

OAT		OBSERVED TGT								
°F	°C	670	680	690	700	710	720	730	740	750
-40	-40.0	+222.3	+224.6	+227.0	+229.3	+231.7	+234.1	+236.4	+238.8	+241.1
-38	-38.9	+216.8	+219.1	+221.4	+223.7	+226.0	+228.2	+230.5	+232.8	+235.1
-36	-37.8	+211.3	+213.5	+215.8	+218.0	+220.2	+222.5	+224.7	+227.0	+229.2
-34	-36.7	+205.9	+208.0	+210.2	+212.4	+214.6	+216.8	+219.0	+221.1	+223.3
-32	-35.6	+200.5	+202.8	+204.7	+206.9	+209.0	+211.1	+213.3	+215.4	+217.5
-30	-34.4	+195.2	+197.2	+199.3	+201.4	+203.5	+205.5	+207.8	+209.7	+211.7
-28	-33.3	+189.9	+191.9	+193.9	+196.0	+198.0	+200.0	+202.0	+204.0	+206.0
-26	-32.2	+184.7	+186.6	+188.6	+190.6	+192.5	+194.5	+196.4	+198.4	+200.4
-24	-31.1	+179.5	+181.4	+183.3	+185.2	+187.1	+189.0	+190.9	+192.8	+194.7
-22	-30.0	+174.4	+176.2	+178.1	+179.9	+181.8	+183.6	+185.5	+187.3	+189.2
-20	-28.9	+169.3	+171.1	+172.9	+174.7	+176.5	+176.3	+180.1	+181.9	+183.7
-18	-27.8	+164.3	+166.0	+167.8	+169.5	+171.2	+173.0	+174.7	+176.5	+178.2
-16	-26.7	+159.3	+161.0	+162.7	+164.4	+166.0	+167.7	+169.4	+171.1	+172.8
-14	-25.6	+154.3	+156.0	+157.6	+159.3	+160.9	+162.5	+164.2	+165.8	+167.4
-12	-24.4	+149.4	+151.0	+152.6	+154.2	+155.8	+157.4	+159.0	+160.5	+162.1
-10	-23.3	+144.6	+146.1	+147.7	+149.2	+150.7	+152.3	+153.8	+155.3	+156.9
-8	-22.2	+139.8	+141.3	+142.7	+144.2	+145.7	+147.2	+148.7	+150.2	+151.6
-6	-21.1	+135.0	+136.4	+137.9	+139.3	+140.7	+142.2	+143.6	+145.0	+146.5
-4	-20.0	+130.0	+131.7	+133.0	+134.4	+135.8	+137.2	+138.6	+140.0	+141.3
-2	-18.9	+125.6	+126.9	+128.3	+129.6	+130.9	+132.3	+133.6	+134.9	+136.3
0	-17.8	+120.9	+122.2	+123.5	+124.8	+126.1	+127.4	+128.6	+129.9	+131.2
2	-16.7	+116.3	+117.6	+118.8	+120.0	+121.3	+122.5	+123.7	+125.0	+126.2
4	-15.6	+111.8	+113.0	+114.1	+115.3	+116.5	+117.7	+118.9	+120.1	+121.3
6	-14.4	+107.3	+108.4	+109.5	+110.7	+111.8	+112.9	+114.1	+115.2	+116.3
8	-13.3	+102.8	+103.9	+104.9	+106.0	+107.1	+108.2	+109.3	+110.4	+111.5
10	-12.2	+98.3	+99.4	+100.4	+101.4	+102.5	+103.5	+104.6	+105.6	+106.7
12	-11.1	+93.9	+94.9	+95.9	+96.9	+97.9	+98.9	+99.9	+100.9	+101.9
14	-10.0	+89.5	+90.5	+91.4	+92.4	+93.3	+94.3	+95.2	+96.2	+97.1
16	-8.9	+85.2	+86.1	+87.0	+87.9	+88.8	+89.7	+90.6	+91.5	+92.4
18	-7.8	+80.9	+81.7	+82.6	+83.5	+84.3	+85.2	+86.0	+86.9	+87.7
20	-6.7	+76.6	+77.4	+78.2	+79.1	+79.9	+80.7	+81.5	+82.3	+83.1
22	-5.6	+72.4	+73.2	+73.9	+74.7	+75.5	+76.2	+77.0	+77.8	+78.5
24	-4.4	+68.2	+68.9	+69.6	+70.4	+71.1	+71.8	+72.5	+73.3	+74.0
26	-3.3	+64.0	+64.7	+65.4	+66.1	+66.7	+67.4	+68.1	+68.8	+69.5
28	-2.2	+59.9	+60.5	+61.2	+61.8	+62.4	+63.1	+63.7	+64.4	+65.0
30	-1.1	+55.8	+56.4	+57.0	+57.6	+58.2	+58.8	+59.4	+60.0	+60.5
32	0.0	+51.7	+52.3	+52.8	+53.4	+53.9	+54.5	+55.0	+55.6	+56.1
34	1.1	+47.7	+48.2	+48.7	+49.2	+49.7	+50.3	+50.8	+51.3	+51.8
36	2.2	+43.7	+44.2	+44.7	+45.1	+45.6	+46.0	+46.5	+47.0	+47.4
38	3.3	+39.8	+40.2	+40.6	+41.0	+41.0	+41.9	+42.3	+42.7	+43.1
40	4.4	+35.8	+36.2	+36.6	+37.0	+37.4	+37.7	+38.1	+38.5	+38.9

93992

HA 2374
MI-0100-71-542

TGT Temperature Correction
Fig.517 (Sheet 9 of 14)

EFFECTIVITY: ALL

71-00-00

Page 598
Dec 15/91

8G

C
C
R
R
050B



RB.211 Propulsion System

MAINTENANCE

UAT		OBSERVED TGT								
°F	°C	670	680	690	700	710	720	730	740	750
42	5.6	+ 31.9	+ 32.3	+ 32.6	+ 33.0	+ 33.3	+ 33.6	+ 34.0	+ 34.3	+ 34.6
44	6.7	+ 28.1	+ 28.4	+ 28.7	+ 29.0	+ 29.3	+ 29.6	+ 29.9	+ 30.1	+ 30.4
46	7.8	+ 24.2	+ 24.5	+ 24.7	+ 25.0	+ 25.3	+ 25.5	+ 25.8	+ 26.0	+ 26.3
48	8.9	+ 20.4	+ 20.6	+ 20.9	+ 21.1	+ 21.3	+ 21.5	+ 21.7	+ 21.9	+ 22.2
50	10.0	+ 16.6	+ 16.8	+ 17.0	+ 17.2	+ 17.3	+ 17.5	+ 17.7	+ 17.9	+ 18.1
52	11.1	+ 12.9	+ 13.0	+ 13.2	+ 13.3	+ 13.4	+ 13.6	+ 13.7	+ 13.8	+ 14.0
54	12.2	+ 9.2	+ 9.3	+ 9.4	+ 9.5	+ 9.6	+ 9.7	+ 9.8	+ 9.9	+ 10.0
56	13.3	+ 5.5	+ 5.5	+ 5.6	+ 5.7	+ 5.7	+ 5.8	+ 5.8	+ 5.9	+ 5.9
58	14.4	+ 1.8	+ 1.8	+ 1.9	+ 1.9	+ 1.9	+ 1.9	+ 1.9	+ 2.0	+ 2.0
60	15.6	- 1.8	- 1.8	- 1.9	- 1.9	- 1.9	- 1.9	- 1.9	- 1.9	+ 2.0
62	16.7	- 5.4	- 5.5	- 5.5	- 5.6	- 5.6	- 5.7	- 5.8	- 5.8	- 5.9
64	17.8	- 9.0	- 9.1	- 9.2	- 9.3	- 9.4	- 9.5	- 9.6	- 9.7	- 9.8
66	18.9	- 12.5	- 12.7	- 12.8	- 12.9	- 13.1	- 13.2	- 13.3	- 13.5	- 13.6
68	20.0	- 16.1	- 16.2	- 16.4	- 16.6	- 16.8	- 16.9	- 17.1	- 17.3	- 17.4
70	21.1	- 19.6	- 19.8	- 20.0	- 20.2	- 20.4	- 20.6	- 20.8	- 21.0	- 21.2
72	22.2	- 23.0	- 23.3	- 23.5	- 23.8	- 24.0	- 24.3	- 24.5	- 24.8	- 25.0
74	23.3	- 26.5	- 26.8	- 27.1	- 27.3	- 27.6	- 27.9	- 28.2	- 28.5	- 28.7
76	24.4	- 29.9	- 30.2	- 30.5	- 30.9	- 31.2	- 31.5	- 31.8	- 32.1	- 32.4
78	25.6	- 33.3	- 33.7	- 34.0	- 34.4	- 34.7	- 35.1	- 35.4	- 35.8	- 36.1
80	26.7	- 36.7	- 37.1	- 37.4	- 37.8	- 38.2	- 38.6	- 39.0	- 39.4	- 39.8
82	27.8	- 40.0	- 40.4	- 40.9	- 41.3	- 41.7	- 42.1	- 42.6	- 43.0	- 43.4
84	28.9	- 43.3	- 43.8	- 44.3	- 44.7	- 45.2	- 45.6	- 46.1	- 46.6	- 47.0
86	30.0	- 46.6	- 47.1	- 47.6	- 48.1	- 48.6	- 49.1	- 49.6	- 50.1	- 50.6
88	31.1	- 49.9	- 50.4	- 51.0	- 51.5	- 52.0	- 52.5	- 53.1	- 53.6	- 54.1
90	32.2	- 53.2	- 53.7	- 54.3	- 54.8	- 55.4	- 56.0	- 56.5	- 57.1	- 57.7
92	33.3	- 56.4	- 57.0	- 57.6	- 58.2	- 58.8	- 59.4	- 60.0	- 60.6	- 61.2
94	34.4	- 59.6	- 60.2	- 60.8	- 61.5	- 62.1	- 62.7	- 63.4	- 64.0	- 64.6
96	35.6	- 62.8	- 63.4	- 64.1	- 64.7	- 65.4	- 66.1	- 66.7	- 67.4	- 68.1
98	36.7	- 65.9	- 66.6	- 67.3	- 68.0	- 68.7	- 69.4	- 70.1	- 70.8	- 71.5
100	37.8	- 69.0	- 69.8	- 70.5	- 71.2	- 72.0	- 72.7	- 73.4	- 74.2	- 74.9
102	38.9	- 72.2	- 72.9	- 73.7	- 74.4	- 75.2	- 76.0	- 76.7	- 77.5	- 78.3
104	40.0	- 75.2	- 76.0	- 76.8	- 77.6	- 78.4	- 79.2	- 80.0	- 80.8	- 81.6
106	41.1	- 78.3	- 79.1	- 80.0	- 80.8	- 81.6	- 82.5	- 83.3	- 84.1	- 84.9
108	42.2	- 81.4	- 82.2	- 83.1	- 83.9	- 84.8	- 85.7	- 86.5	- 87.4	- 88.3
110	43.3	- 84.4	- 85.3	- 86.2	- 87.1	- 88.0	- 88.8	- 89.7	- 90.6	- 91.5
112	44.4	- 87.4	- 88.3	- 89.2	- 90.2	- 91.1	- 92.0	- 92.9	- 93.9	- 94.8
114	45.6	- 90.4	- 91.3	- 92.3	- 93.2	- 94.2	- 95.1	- 96.1	- 97.1	- 98.0
116	46.7	- 93.3	- 94.3	- 95.3	- 96.3	- 97.3	- 98.3	- 99.3	- 100.2	- 101.2
118	47.8	- 96.3	- 97.3	- 98.3	- 99.3	- 100.3	- 101.4	- 102.4	- 103.4	- 104.4
120	48.9	- 99.2	- 100.2	- 101.3	- 102.3	- 103.4	- 104.4	- 105.5	- 106.5	- 107.6
122	50.0	- 102.1	- 103.2	- 104.2	- 105.3	- 106.4	- 107.5	- 108.6	- 109.7	- 110.7
124	51.1	- 105.0	- 106.1	- 107.2	- 108.3	- 109.4	- 110.5	- 111.6	- 112.7	- 113.9

HA 2375
M10100-71 543
36774

C
C

TGT Temperature Correction
Fig.517 (Sheet 10 of 14)

EFFECTIVITY: ALL

050B

8G

71-00-00
Page 599
Jun 15/96



RB.211 Propulsion System

MAINTENANCE

OAT		OBSERVED TGT									
°F	°C	760	770	780	790	800	810	820	830	840	
-40	-40.0	+243.5	+245.8	+248.2	+250.6	+252.9	+255.3	+257.6	+260.0	+262.3	
-38	-38.9	+237.	+239.7	+242.0	+244.3	+246.6	+248.9	+251.2	+253.5	+255.8	
-36	-37.8	+231.5	+233.7	+235.9	+238.2	+240.4	+242.7	+244.9	+247.1	+249.4	
-34	-36.7	+225.5	+227.7	+229.9	+232.1	+234.2	+236.4	+238.6	+240.8	+243.0	
-32	-35.6	+219.6	+221.8	+223.9	+226.0	+228.1	+230.3	+232.4	+234.5	+236.6	
-30	-34.4	+213.8	+215.9	+217.9	+220.0	+222.1	+224.2	+226.2	+228.3	+230.4	
-28	-33.3	+208.0	+210.0	+212.1	+214.1	+216.1	+218.1	+220.1	+222.1	+224.1	
-26	-32.2	+202.3	+204.3	+206.2	+208.2	+210.1	+212.1	+214.1	+216.0	+218.0	
-24	-31.1	+196.6	+198.6	+200.5	+202.4	+204.3	+206.2	+208.1	+210.0	+211.9	
-22	-30.0	+191.0	+192.9	+194.7	+196.6	+198.4	+200.3	+202.1	+204.0	+205.8	
-20	-28.9	+185.5	+187.3	+189.1	+190.9	+192.7	+194.4	+196.2	+198.0	+199.8	
-18	-27.8	+180.0	+181.7	+183.4	+185.2	+186.9	+188.7	+190.4	+192.2	+193.9	
-16	-26.7	+174.5	+176.2	+177.9	+179.6	+181.2	+182.9	+184.6	+186.3	+188.0	
-14	-25.6	+169.1	+170.7	+172.4	+174.0	+175.6	+177.3	+178.9	+180.5	+182.2	
-12	-24.4	+163.7	+165.3	+166.9	+168.5	+170.1	+171.6	+173.2	+174.8	+176.4	
-10	-23.3	+158.4	+159.9	+161.5	+163.0	+164.5	+166.1	+167.6	+169.1	+170.7	
-8	-22.2	+153.1	+154.6	+156.1	+157.6	+159.1	+160.5	+162.0	+163.5	+165.0	
-6	-21.1	+147.9	+149.3	+150.8	+152.2	+153.6	+155.1	+156.5	+157.9	+159.4	
-4	-20.0	+142.7	+144.1	+145.4	+146.9	+148.2	+149.6	+151.0	+152.4	+153.8	
-2	-18.9	+137.6	+138.9	+140.2	+141.6	+142.9	+144.2	+145.6	+146.9	+148.2	
0	-17.8	+132.5	+133.8	+135.1	+136.3	+137.6	+138.9	+140.2	+141.5	+142.8	
2	-16.7	+127.4	+128.7	+129.9	+131.1	+132.4	+133.6	+134.9	+136.1	+137.3	
4	-15.6	+122.4	+123.6	+124.8	+126.0	+127.2	+128.4	+129.6	+130.7	+131.9	
6	-14.4	+117.5	+118.6	+119.8	+120.9	+122.0	+123.2	+124.3	+125.4	+126.6	
8	-13.3	+112.6	+113.7	+114.7	+115.8	+116.9	+118.0	+119.1	+120.2	+121.3	
10	-12.2	+107.7	+108.7	+109.8	+110.8	+111.9	+112.9	+114.0	+115.0	+116.0	
12	-11.1	+102.9	+103.9	+104.9	+105.8	+106.8	+107.8	+108.8	+109.8	+110.8	
14	-10.0	+98.1	+99.0	+100.0	+100.9	+101.9	+102.8	+103.8	+104.7	+105.7	
16	-8.9	+93.3	+94.2	+95.1	+96.0	+96.9	+97.8	+98.7	+99.6	+100.5	
18	-7.8	+88.6	+89.5	+90.3	+91.2	+92.0	+92.9	+93.8	+94.6	+95.5	
20	-6.7	+83.9	+84.7	+85.6	+86.4	+87.2	+88.0	+88.8	+89.6	+90.4	
22	-5.6	+79.3	+80.1	+80.8	+81.6	+82.4	+83.1	+83.9	+84.7	+85.4	
24	-4.4	+74.7	+75.4	+76.1	+76.9	+77.6	+78.3	+79.0	+79.8	+80.5	
26	-3.3	+70.1	+70.8	+71.5	+72.2	+72.9	+73.5	+74.2	+74.9	+75.6	
28	-2.2	+65.6	+66.3	+66.9	+67.5	+68.2	+68.8	+69.4	+70.1	+70.7	
30	-1.1	+61.1	+61.7	+62.3	+62.9	+63.5	+64.1	+64.7	+65.3	+65.9	
32	0.0	+56.7	+57.2	+57.8	+58.3	+58.9	+59.4	+60.0	+60.5	+61.1	
34	1.1	+52.3	+52.8	+53.3	+53.8	+54.3	+54.8	+55.3	+55.8	+56.3	
36	2.2	+47.9	+48.4	+48.8	+49.3	+49.8	+50.2	+50.7	+51.1	+51.6	
38	3.3	+43.6	+44.0	+44.4	+44.8	+45.2	+45.7	+46.1	+46.5	+46.9	
40	4.4	+39.3	+39.6	+40.0	+40.4	+40.8	+41.2	+41.5	+41.9	+42.3	

93993

HA 2376

M1-0100-71-544

C
C

TGT Temperature Correction
Fig.517 (Sheet 11 of 14)

EFFECTIVITY: ALL

0508

8G

71-00-00

Page 600
Jun 15/96



RB.211 Propulsion System

MAINTENANCE

OAT		OBSERVED TGT									
°F	°C	760	770	780	790	800	810	820	830	840	
42	5.6	+ 35.0	+ 35.3	+ 35.7	+ 36.0	+ 36.3	+ 36.7	+ 37.0	+ 37.4	+ 37.7	
44	6.7	+ 30.7	+ 31.0	+ 31.3	+ 31.6	+ 31.9	+ 32.2	+ 32.5	+ 32.8	+ 33.1	
46	7.8	+ 26.5	+ 26.8	+ 27.1	+ 27.3	+ 27.6	+ 27.8	+ 28.1	+ 28.3	+ 28.6	
48	8.9	+ 22.4	+ 22.6	+ 22.8	+ 23.0	+ 23.2	+ 23.5	+ 23.7	+ 23.9	+ 24.1	
50	10.0	+ 18.2	+ 18.4	+ 18.6	+ 18.8	+ 18.9	+ 19.1	+ 19.3	+ 19.5	+ 19.6	
52	11.1	+ 14.1	+ 14.3	+ 14.4	+ 14.5	+ 14.7	+ 14.8	+ 14.9	+ 15.1	+ 15.2	
54	12.2	+ 10.0	+ 10.1	+ 10.2	+ 10.3	+ 10.4	+ 10.5	+ 10.6	+ 10.7	+ 10.8	
56	13.3	+ 6.0	+ 6.1	+ 6.1	+ 6.2	+ 6.2	+ 6.3	+ 6.4	+ 6.4	+ 6.5	
58	14.4	+ 2.0	+ 2.0	+ 2.0	+ 2.1	+ 2.1	+ 2.1	+ 2.1	+ 2.1	+ 2.1	
60	15.6	- 2.0	- 2.0	- 2.0	- 2.0	- 2.1	- 2.1	- 2.1	- 2.1	- 2.1	
62	16.7	- 5.9	- 6.0	- 6.1	- 6.1	- 6.2	- 6.2	- 6.3	- 6.3	- 6.4	
64	17.8	- 9.9	- 10.0	- 10.0	- 10.1	- 10.2	- 10.3	- 10.4	- 10.5	- 10.6	
66	18.9	- 13.7	- 13.9	- 14.0	- 14.1	- 14.3	- 14.4	- 14.5	- 14.7	- 14.8	
68	20.0	- 17.6	- 17.8	- 17.9	- 18.1	- 18.3	- 18.5	- 18.6	- 18.8	- 19.0	
70	21.1	- 21.4	- 21.6	- 21.9	- 22.1	- 22.3	- 22.5	- 22.7	- 22.9	- 23.1	
72	22.2	- 25.2	- 25.5	- 25.7	- 26.0	- 26.2	- 26.5	- 26.7	- 27.0	- 27.2	
74	23.3	- 29.0	- 29.3	- 29.6	- 29.9	- 30.1	- 30.4	- 30.7	- 31.0	- 31.3	
76	24.4	- 32.8	- 33.1	- 33.4	- 33.7	- 34.0	- 34.3	- 34.7	- 35.0	- 35.3	
78	25.6	- 36.5	- 36.8	- 37.2	- 37.5	- 37.9	- 38.2	- 38.6	- 39.0	- 39.3	
80	26.7	- 40.2	- 40.6	- 40.9	- 41.3	- 41.7	- 42.1	- 42.5	- 42.9	- 43.3	
82	27.8	- 43.8	- 44.3	- 44.7	- 45.1	- 45.5	- 46.0	- 46.4	- 46.8	- 47.2	
84	28.9	- 47.5	- 47.9	- 48.4	- 48.9	- 49.3	- 49.8	- 50.2	- 50.7	- 51.1	
86	30.0	- 51.1	- 51.6	- 52.1	- 52.6	- 53.1	- 53.6	- 54.0	- 54.5	- 55.0	
88	31.1	- 54.7	- 55.2	- 55.7	- 56.3	- 56.8	- 57.3	- 57.8	- 58.4	- 58.9	
90	32.2	- 58.2	- 58.8	- 59.4	- 59.9	- 60.5	- 61.0	- 61.6	- 62.2	- 62.7	
92	33.3	- 61.8	- 62.4	- 63.0	- 63.5	- 64.1	- 64.7	- 65.3	- 65.9	- 66.5	
94	34.4	- 65.3	- 65.9	- 66.5	- 67.2	- 67.8	- 68.4	- 69.1	- 69.7	- 70.3	
96	35.6	- 68.7	- 69.4	- 70.1	- 70.7	- 71.4	- 72.1	- 72.7	- 73.4	- 74.1	
98	36.7	- 72.2	- 72.9	- 73.6	- 74.3	- 75.0	- 75.7	- 76.4	- 77.1	- 77.8	
100	37.8	- 75.6	- 76.4	- 77.1	- 77.8	- 78.6	- 79.3	- 80.0	- 80.8	- 81.5	
102	38.9	- 79.0	- 79.8	- 80.6	- 81.3	- 82.1	- 82.9	- 83.6	- 84.4	- 85.2	
104	40.0	- 82.4	- 83.2	- 84.0	- 84.8	- 85.6	- 86.4	- 87.2	- 88.0	- 88.8	
106	41.1	- 85.8	- 86.6	- 87.4	- 88.3	- 89.1	- 89.9	- 90.8	- 91.6	- 92.4	
108	42.2	- 89.1	- 90.0	- 90.8	- 91.7	- 92.6	- 93.4	- 94.3	- 95.2	- 96.0	
110	43.3	- 92.4	- 93.3	- 94.2	- 95.1	- 96.0	- 96.9	- 97.8	- 98.7	- 99.6	
112	44.4	- 95.7	- 96.6	- 97.6	- 98.5	- 99.4	- 100.3	- 101.3	- 102.2	- 103.1	
114	45.6	- 99.0	- 99.9	- 100.9	- 101.9	- 102.8	- 103.8	- 104.7	- 105.7	- 106.6	
116	46.7	- 102.2	- 103.2	- 104.2	- 105.2	- 106.2	- 107.2	- 108.2	- 109.2	- 110.1	
118	47.8	- 105.4	- 106.5	- 107.5	- 108.5	- 109.5	- 110.5	- 111.6	- 112.6	- 113.6	
120	48.9	- 108.6	- 109.7	- 110.7	- 111.8	- 112.9	- 113.9	- 115.0	- 116.0	- 117.1	
122	50.0	- 111.8	- 112.9	- 114.0	- 115.1	- 116.1	- 117.2	- 118.3	- 119.4	- 120.5	
124	51.1	- 115.0	- 116.1	- 117.2	- 118.3	- 119.4	- 120.5	- 121.7	- 122.8	- 123.9	

93994

HA 2377
M1-0100-71-545

C
C

TGT Temperature Correction
Fig.517 (Sheet 12 of 14)

EFFECTIVITY: ALL

050B

8G

71-00-00

Page 601
Jun 15/96



RB.211 Propulsion System

MAINTENANCE

OAT		OBSERVED TGT					
°F	°C	850	860	870	880	890	900
-40	-40.0	+264.7	+267.1	+269.4	+271.8	+274.1	+276.5
-38	-38.9	+258.1	+260.4	+262.7	+265.0	+267.3	+269.6
-36	-37.8	+251.6	+253.9	+256.1	+258.3	+260.6	+262.8
-34	-36.7	+245.2	+247.3	+249.5	+251.7	+253.9	+256.1
-32	-35.6	+238.8	+240.9	+243.0	+245.1	+247.3	+249.4
-30	-34.4	+232.4	+234.5	+236.6	+238.6	+240.7	+242.8
-28	-33.3	+226.2	+228.2	+230.2	+232.2	+234.2	+236.2
-26	-32.2	+219.9	+221.9	+223.9	+225.8	+227.8	+229.7
-24	-31.1	+213.8	+215.7	+217.6	+219.5	+221.4	+223.3
-22	-30.0	+207.7	+209.5	+211.4	+213.2	+215.1	+216.9
-20	-28.9	+201.6	+203.4	+205.2	+207.0	+208.8	+210.6
-18	-27.8	+195.6	+197.4	+199.1	+200.9	+202.6	+204.3
-16	-26.7	+189.7	+191.4	+193.1	+194.8	+196.5	+198.1
-14	-25.6	+183.8	+185.4	+187.1	+188.7	+190.4	+192.0
-12	-24.4	+178.0	+179.6	+181.1	+182.7	+184.3	+185.9
-10	-23.3	+172.2	+173.7	+175.3	+176.8	+178.3	+179.9
-8	-22.2	+166.5	+167.9	+169.4	+170.9	+172.4	+173.9
-6	-21.1	+160.8	+162.2	+163.6	+165.1	+166.5	+167.9
-4	-20.0	+155.2	+156.5	+157.9	+159.3	+160.7	+162.1
-2	-18.9	+149.6	+150.9	+152.2	+153.6	+154.9	+156.2
0	-17.8	+144.0	+145.3	+146.6	+147.9	+149.2	+150.4
2	-16.7	+138.6	+139.8	+141.0	+142.3	+143.5	+144.7
4	-15.6	+133.1	+134.3	+135.5	+136.7	+137.9	+139.0
6	-14.4	+127.7	+128.9	+130.0	+131.1	+132.3	+133.4
8	-13.3	+122.4	+123.5	+124.6	+125.6	+126.7	+127.8
10	-12.2	+117.1	+118.1	+119.2	+120.2	+121.2	+122.3
12	-11.1	+111.8	+112.8	+113.8	+114.8	+115.8	+116.8
14	-10.0	+106.6	+107.6	+108.5	+109.5	+110.4	+111.4
16	-8.9	+101.4	+102.4	+103.3	+104.2	+105.1	+106.0
18	-7.8	+96.3	+97.2	+98.0	+98.9	+99.8	+100.6
20	-6.7	+91.2	+92.1	+92.9	+93.7	+94.5	+95.3
22	-5.6	+86.2	+87.0	+87.7	+88.5	+89.3	+90.0
24	-4.4	+81.2	+81.9	+82.7	+83.4	+84.1	+84.8
26	-3.3	+76.3	+76.9	+77.6	+78.3	+79.0	+79.6
28	-2.2	+71.3	+72.0	+72.6	+73.2	+73.9	+74.5
30	-1.1	+66.5	+67.1	+67.6	+68.2	+68.8	+69.4
32	0.0	+61.6	+62.2	+62.7	+63.3	+63.8	+64.4
34	1.1	+56.8	+57.3	+57.8	+58.4	+58.9	+59.4
36	2.2	+52.1	+52.5	+53.0	+53.5	+53.9	+54.4
38	3.3	+47.4	+47.8	+48.2	+48.6	+49.0	+49.5
40	4.4	+42.7	+43.1	+43.4	+43.8	+44.2	+44.6

93995
HA 2378
MI-0100-71-546

C
C

TGT Temperature Correction
Fig.517 (Sheet 13 of 14)

EFFECTIVITY: ALL

050B

8G

71-00-00
Page 602
Jun 15/96



RB.211 Propulsion System

MAINTENANCE

OAT		OBSERVED TGT						
°F	°C	850	860	870	880	890	900	
42	5.6	+ 38.0	+ 38.4	+ 38.7	+ 39.0	+ 39.4	+ 39.7	
44	6.7	+ 33.4	+ 33.7	+ 34.0	+ 34.3	+ 34.6	+ 34.9	
46	7.8	+ 28.9	+ 29.1	+ 29.4	+ 29.6	+ 29.9	+ 30.1	
48	8.9	+ 24.3	+ 24.5	+ 24.7	+ 25.0	+ 25.2	+ 25.4	
50	10.0	+ 19.8	+ 20.0	+ 20.2	+ 20.3	+ 20.5	+ 20.7	
52	11.1	+ 15.4	+ 15.5	+ 15.6	+ 15.8	+ 15.9	+ 16.0	
54	12.2	+ 10.9	+ 11.0	+ 11.1	+ 11.2	+ 11.3	+ 11.4	
56	13.3	+ 6.5	+ 6.6	+ 6.6	+ 6.7	+ 6.8	+ 6.8	
58	14.4	+ 2.2	+ 2.2	+ 2.2	+ 2.2	+ 2.2	+ 2.3	
60	15.6	- 2.2	- 2.2	- 2.2	- 2.2	- 2.2	- 2.3	
62	16.7	- 6.5	- 6.5	- 6.6	- 6.6	- 6.7	- 6.7	
64	17.8	- 10.7	- 10.8	- 10.9	- 11.0	- 11.1	- 11.2	
66	18.9	- 14.9	- 15.1	- 15.2	- 15.3	- 15.5	- 15.6	
68	20.0	- 19.1	- 19.3	- 19.5	- 19.7	- 19.8	- 20.0	
70	21.1	- 23.3	- 23.5	- 23.7	- 23.9	- 24.1	- 24.3	
72	22.2	- 27.4	- 27.7	- 27.9	- 28.2	- 28.4	- 28.7	
74	23.3	- 31.5	- 31.8	- 32.1	- 32.4	- 32.7	- 32.9	
76	24.4	- 35.6	- 35.9	- 36.3	- 36.6	- 36.9	- 37.2	
78	25.6	- 39.7	- 40.0	- 40.4	- 40.7	- 41.1	- 41.4	
80	26.7	- 43.7	- 44.1	- 44.4	- 44.8	- 45.2	- 45.6	
82	27.8	- 47.7	- 48.1	- 48.5	- 48.9	- 49.4	- 49.8	
84	28.9	- 51.6	- 52.1	- 52.5	- 53.0	- 53.4	- 53.9	
86	30.0	- 55.5	- 56.0	- 56.5	- 57.0	- 57.5	- 58.0	
88	31.1	- 59.4	- 60.0	- 60.5	- 61.0	- 61.5	- 62.1	
90	32.2	- 63.3	- 63.9	- 64.4	- 65.0	- 65.6	- 66.1	
92	33.3	- 67.1	- 67.7	- 68.3	- 68.9	- 69.5	- 70.1	
94	34.4	- 70.9	- 71.6	- 72.2	- 72.8	- 73.5	- 74.1	
96	35.6	- 74.7	- 75.4	- 76.1	- 76.7	- 77.4	- 78.1	
98	36.7	- 78.5	- 79.2	- 79.9	- 80.6	- 81.3	- 82.0	
100	37.8	- 82.2	- 83.0	- 83.7	- 84.4	- 85.1	- 85.9	
102	38.9	- 85.9	- 86.7	- 87.5	- 88.2	- 89.0	- 89.7	
104	40.0	- 89.6	- 90.4	- 91.2	- 92.0	- 92.8	- 93.6	
106	41.1	- 93.3	- 94.1	- 94.9	- 95.7	- 96.6	- 97.4	
108	42.2	- 96.9	- 97.7	- 98.6	- 99.5	- 100.3	- 101.2	
110	43.3	- 100.5	- 101.4	- 102.3	- 103.2	- 104.1	- 105.0	
112	44.4	- 104.1	- 105.0	- 105.9	- 106.8	- 107.8	- 108.7	
114	45.6	- 107.6	- 108.6	- 109.5	- 110.5	- 111.4	- 112.4	
116	46.7	- 111.1	- 112.1	- 113.1	- 114.1	- 115.1	- 116.1	
118	47.8	- 114.6	- 115.7	- 116.7	- 117.7	- 118.7	- 119.7	
120	48.9	- 118.1	- 119.2	- 120.2	- 121.3	- 122.3	- 123.4	
122	50.0	- 121.6	- 122.6	- 123.7	- 124.8	- 125.9	- 127.0	
124	51.1	- 125.0	- 126.1	- 127.2	- 128.3	- 129.4	- 130.6	

93996
HA 2379
M1-0100-71-547

C
C

TGT Temperature Correction
Fig.517 (Sheet 14 of 14)

EFFECTIVITY: ALL

050B

8G

71-00-00
Page 603
Jun 15/96



MAINTENANCE

- C Correct stabilized data recorded as described in
C following examples:
- C Example 1 Turbine Gas Temperature 586 deg.C.
C Ambient Temperature = T 36 deg.F (2.2 deg.C.)
C N3 = 88.55 observed
C N2 = 90.90 observed
C N1 = 84.10 observed
- C 1. Round off each readings to nearest even number and
C turbine gas temeprature to nearest 10 deg. when
C entering table.
- C Refer to Fig.509 for speed correction for all 3
C rotor speeds.
- C Refer to Fig.510 for turbine gas temeprature correction.
- C (a) Observed N1 = 84.10 Percent
C Correction
C Figure for 36 deg. and 84 percent = +1.90 Percent
C Corrected N1 = 86.00 Percent
- C (b) Same procedure for N2 and N3
- C (c) Observed Turbine Gas Temperature = 586 deg.C.
C Correction figure
C For 36 deg. and 590 deg. = +40 deg.
C Corrected Turbine Gas Temperature = 626 deg.C.
- C NOTE: In the preceding example, ambient
C temperature was below 59 deg.F. (15 deg.C.)
C standard day, so corrections are + (plus)
C and are, therefore, added.

Correction Factors
Fig.518 (Sheet 1)

EFFECTIVITY: ALL

050B

8G

71-00-00
Page 604
Jun 15/96



RB.211 Propulsion System

MAINTENANCE

C Example 2 Turbine Gas Temperature 680 deg.C.
C Ambient Temperature = T = 90 deg.F (32.2 deg.C.)
C N1 = 88.53
C N2 = 93.6
C N3 = 92.65

C (a) Observed N1 = 88.53 Percent
C Correction for
C 90 deg. and 88 percent = -2.50 Percent
C Corrected N1 = 86.03 Percent

C (b) Same procedure for N2 and N3

C (c) Observed Turbine Gas Temperature = 680 deg.C.
C Correction figure
C For 90 deg. and 680 deg. = -53.7
C Corrected Turbine Gas Temperature = 626.3 deg.C.

C NOTE: Ambient tempeprature is above 59 deg.F.
C (15 deg.C.), so corrections are - (minus)
C and are substracted.

Correction Factors
Fig.518 (Sheet 2)

EFFECTIVITY: ALL

050B

8G

71-00-00
Page 605
Jun.15/96



RB.211 Propulsion System

MAINTENANCE

A. CORRECTED SHAFT SPEEDS

1. CORRECTED N_1 PERCENT = OBSERVED N_1 (PERCENT) $\times \frac{1}{\sqrt{\theta}}$
2. CORRECTED N_2 PERCENT = OBSERVED N_2 (PERCENT) $\times \frac{1}{\sqrt{\theta}}$
3. CORRECTED N_3 PERCENT = OBSERVED N_3 (PERCENT) $\times \frac{1}{\sqrt{\theta}}$

NOTE θ = ABSOLUTE TEMP RATIO $\frac{T \text{ (AMBIENT)}}{T \text{ (STD)}}$

B. CORRECTED TURBINE GAS TEMPERATURE

1. CORRECTED TURBINE GAS TEMPERATURE $^{\circ}\text{C}$ = OBSERVED TURBINE GAS TEMPERATURE $^{\circ}\text{C}$ $\times \frac{1}{\theta}$

NOTE THIS CORRECTION IS FOR BOTH BALLASTED AND UNBALLASTED TURBINE GAS TEMPERATURE

C. CORRECT STABILIZED DATA RECORDED AS DESCRIBED IN FOLLOWING EXAMPLES :

EXAMPLE 1 TURBINE GAS TEMPERATURE 586°C
 AMBIENT TEMPERATURE = T 36°F (2.2°C)
 N_3 = 88.55 OBSERVED
 N_2 = 90.90 OBSERVED
 N_1 = 84.10 OBSERVED

1. ROUND OFF TACH READINGS TO NEAREST EVEN NUMBER AND TURBINE GAS TEMPERATURE TO NEAREST 10° WHEN ENTERING TABLE.

REFER TO FIGURE 509 FOR SPEED CORRECTION
 REFER TO FIGURE 510 FOR TURBINE GAS TEMPERATURE CORRECTION

- a) OBSERVED N_1 = 84.10 PERCENT
 CORRECTION
 FIGURE FOR 36° AND 84 PERCENT = $+ 1.90$ PERCENT
 CORRECTED N_1 = 86.00 PERCENT
- b) SAME PROCEDURE FOR N_2 AND N_3
- c) OBSERVED TURBINE GAS TEMPERATURE = 586°C
 CORRECTION FIGURE
 FOR 36° AND 580° = $+ 40^{\circ}$
 CORRECTED TURBINE GAS TEMPERATURE = 626°C

NOTE IN THE PRECEDING EXAMPLE, AMBIENT TEMPERATURE WAS BELOW 59°F (15°C) STANDARD DAY SO CORRECTIONS ARE + AND ARE THEREFORE ADDED.

EXAMPLE 2 TURBINE GAS TEMPERATURE 680°C
 AMBIENT TEMPERATURE = T 90°F (32.2°C)
 N_1 = 88.53
 N_2 = 93.8
 N_3 = 92.66

- a) OBSERVED N_1 = 88.53 PERCENT
 CORRECTION FOR
 90° AND 88 PERCENT = $- 2.50$ PERCENT
 CORRECTED N_1 = 86.03 PERCENT
- b) SAME PROCEDURE FOR N_2 AND N_3
- c) OBSERVED TURBINE GAS TEMPERATURE = 680°C
 CORRECTION FIGURE
 FOR 90° AND 680° = $- 53.7$
 CORRECTED TURBINE GAS TEMPERATURE = 626.3°C

NOTE AMBIENT TEMPERATURE IS ABOVE 59°F (15°C) SO CORRECTIONS ARE MINUS (-) AND ARE SUBTRACTED.

M1-5005-71-525
36779

C
C

Correction factors
Fig.518 (Sheet 3)

EFFECTIVITY: ALL

050B

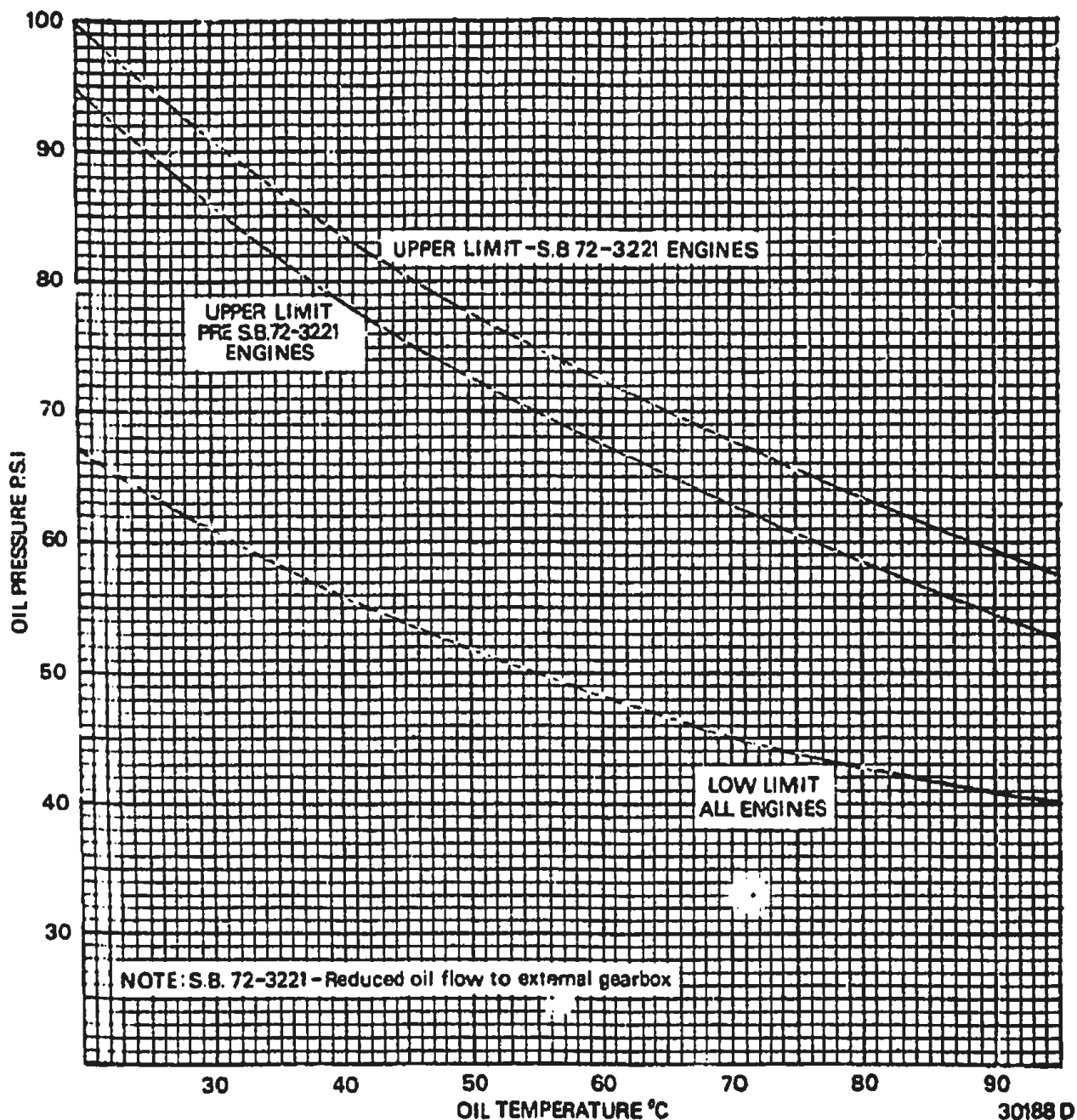
8G

71-00-00
Page 606
Jun 15/96



RB.211 Propulsion System

MAINTENANCE



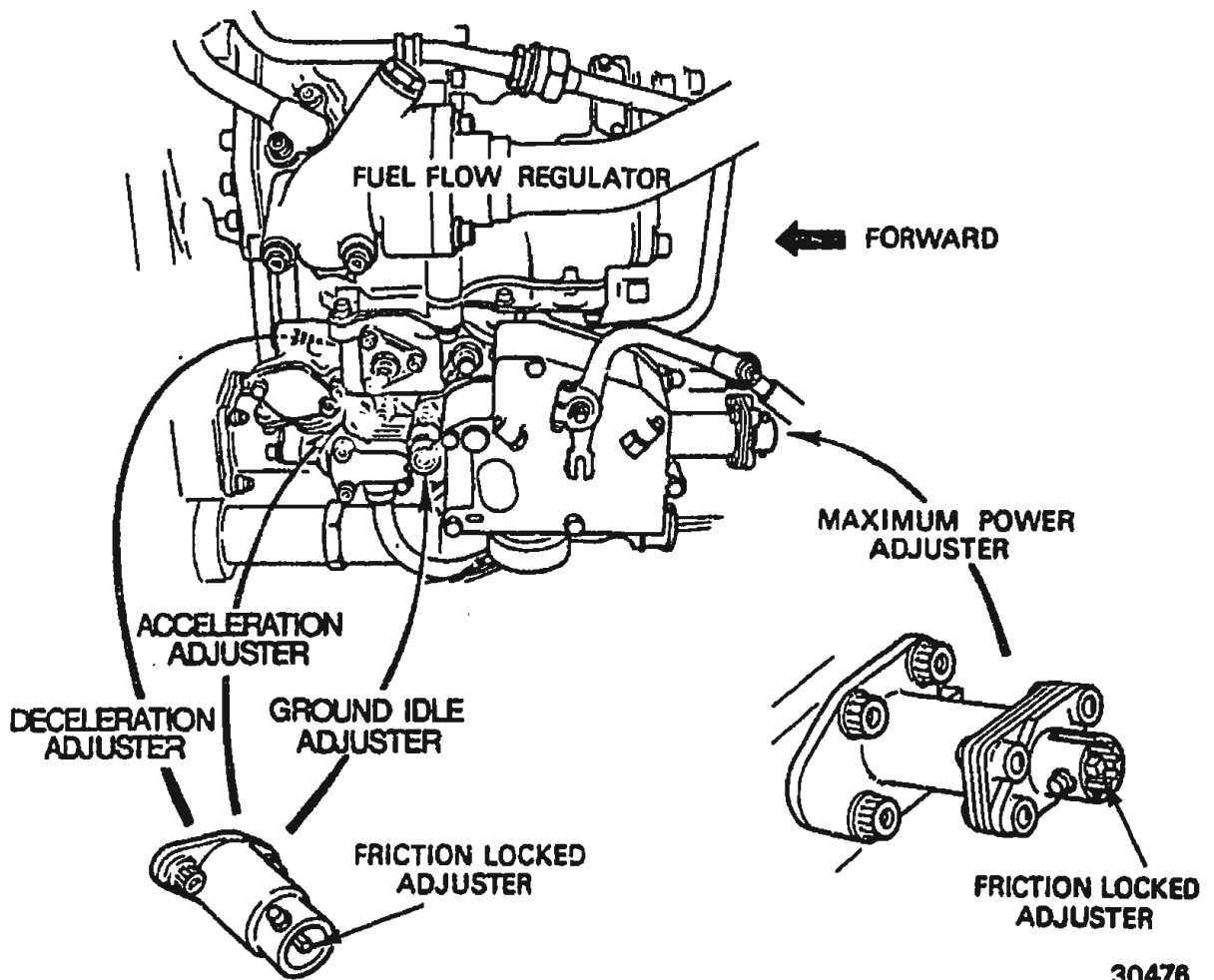
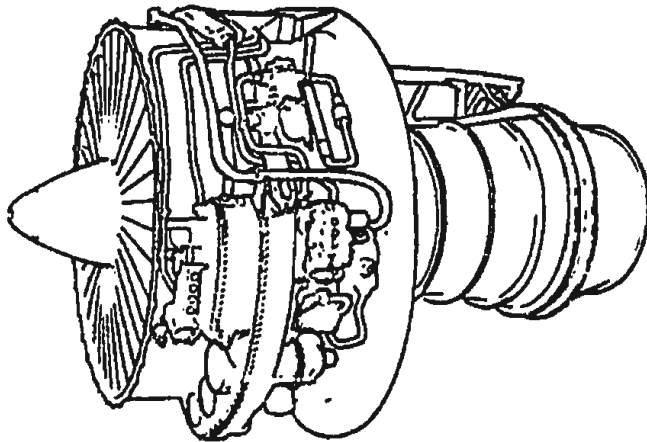
Oil Pressure Acceptance Limits
(only valid above 1.35 E.P.R.)
Fig. 519

EFFECTIVITY: ALL

050B

8G

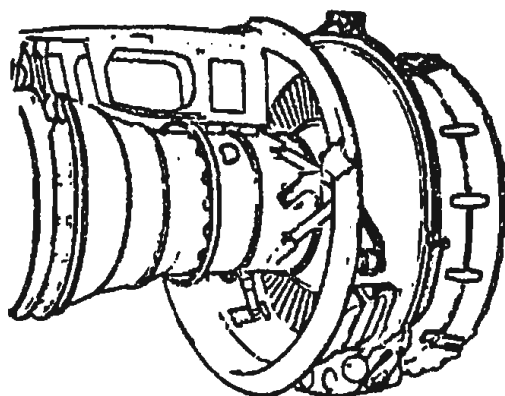
71-00-00
Page 607
Jun 15/96



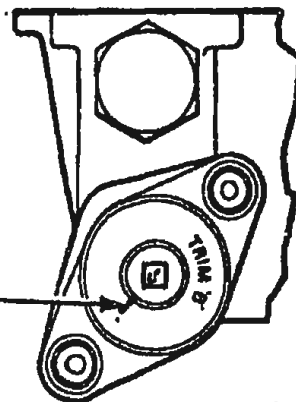
30476

Fuel Control System Adjusters
Fig.520

EFFECTIVITY: ALL

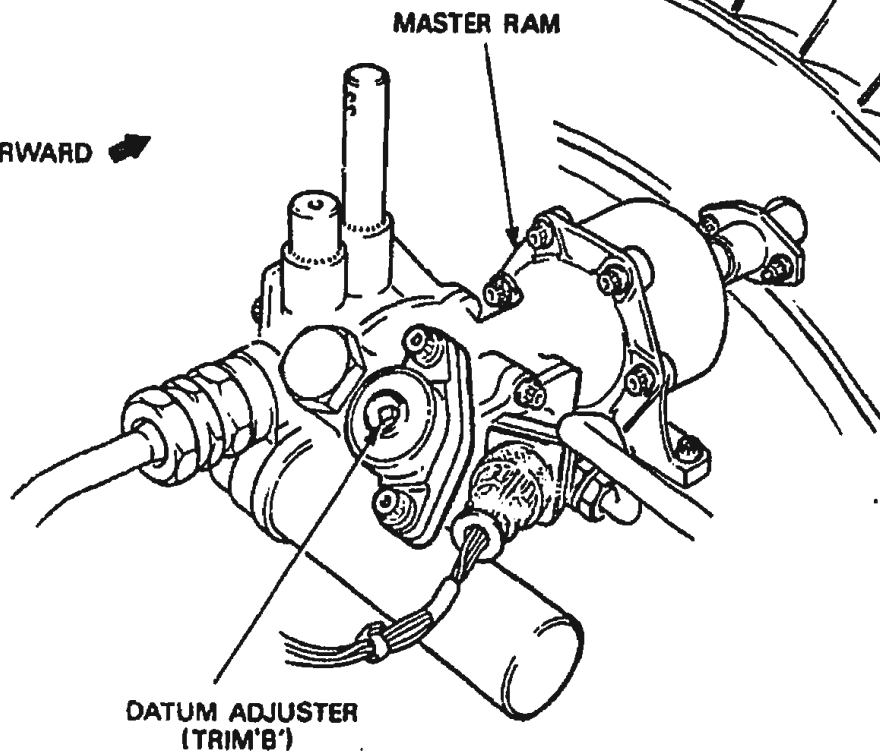


ZONES 410, 420 AND 430



RIG DATUM
SETTING MARK

FORWARD →

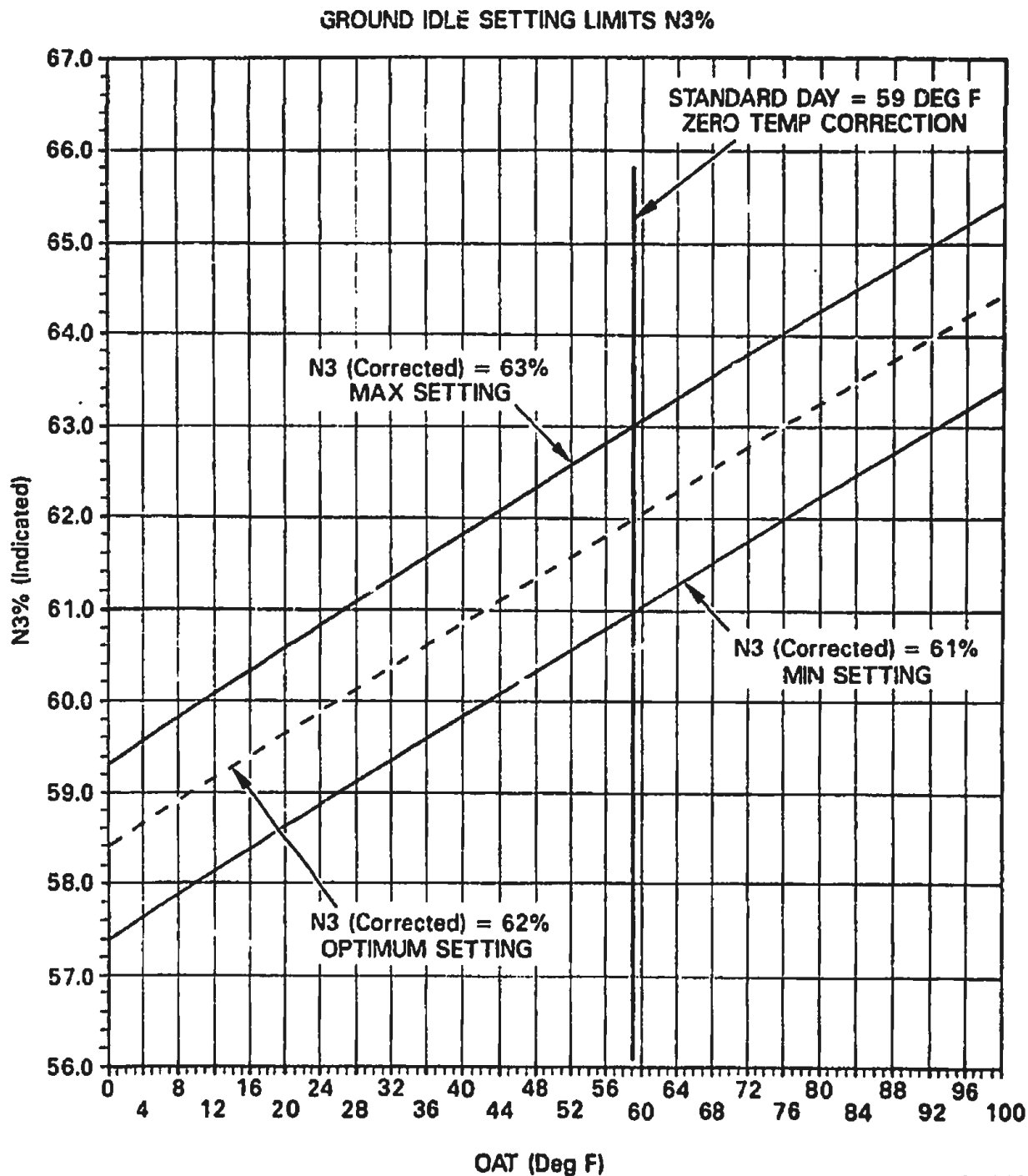


DATUM ADJUSTER
(TRIM 'B')

28694A

I.P. Compressor Airflow Control System Adjuster
(Plessey S.B. I.G.V. 75-2)
Fig.521

EFFECTIVITY: ALL



C3110

C
C

N3 Idle Graph
Fig.522

EFFECTIVITY: ALL

050B

86

71-00-00
Page 610
Jun 15/96



RB.211 Propulsion System

MAINTENANCE

POWER PLANT - INSPECTION/CHECK

1. Inspection After Shock Loading

Shock loading of a power plant or engine may arise from service handling, damage in transit, or crash damage.

The following inspections are intended to serve as a guide in determining if the power plant or engine is serviceable, but the final decision will depend on the nature and cause of the damage. If airframe or engine damage is apparent further work may be required and Rolls-Royce should be contacted for advice.

R
R

A. Inspect Power Plant Externally

Inspect, in particular, the following for general damage, cracking, and distortion.

Nose cowl, air intake (also for debris); ensure air inlet shut-off valve duct is not blocked.

Using a strong spotlight examine, as far as possible, the engine rotating assemblies from the front and rear of the engine.

Engine mounts and associated areas. L.P. compressor case support structure and outlet guide vanes. L.P. compressor blades, including blade tips for evidence of foul with L.P. compressor case attrition lining.

Examine spoiler door actuation rods for cracks, distortion and damage to ballscrew nut housing at rod attachment.

Gas generator fairings. L.P. compressor case and gas generator cases, with particular attention to bolted flanges. H.S. external gearbox mounting brackets and suspension links; H.S. external gearbox drive and housing, driveshaft and shroud.

Power plant mounted accessory units, tubes and electrical harness; for fuel and oil system units crack testing may be advisable. If it is suspected that damage may have been transmitted to the unit mounting structure on the engine, further investigation will be required.

EFFECTIVITY: ALL

050B

1A

71-00-00
Page 601
Nov 15/86



RB.211 Propulsion System

MAINTENANCE

Check engine controls for freedom, full range of movement and correct operation (Ref. 76-11-02, Inspection/Check).

B. Rotate Engine Main Rotating Assemblies

Providing the inspection at 1.A. has produced no evidence to prevent engine being rotated, proceed as follows:

Rotate L.P., I.P., and H.P. rotating systems (Ref. 72-00-00, Servicing); checking for free and smooth rotation, and listening for unusual noises indicative of internal damage, or rubbing.

C. Inspect Engine Internally

Inspect complete engine internally (Ref. 72-00-00, Inspection/Check).

D. Ground Run Engine

Test engine (Ref. Adjustment/Test, Table 501) and check run-down time, listening for unusual noises that may indicate distortion or malalignment. Inspect the L.P. compressor case mounted tubes and connectors for leaks and rectify as necessary.

E. Inspect fine scavenge filter, magnetic chip detectors, and scavenge strainer elements (Ref. 72-01-00, Inspection/Check).

F. If the engine is serviceable, repair any surface damage (Ref. 70-42-12).

2. Inspection After In-flight Windmilling

R
R

If engine shutdown has been effected by operation of fire handle, replace hydraulic pump, reference 29-11-07 - Removal/Installation.

The following procedures must only be applied after the reason for shutdown has been determined and the cause rectified.

EFFECTIVITY: ALL

0508

1A

71-00-00

Page 602
May 15/89



RB.211 Propulsion System

MAINTENANCE

- A. After duration of 30 minutes or less, with or without complete loss of oil pressure
 - (1) Check oil level (Ref. 12-12-01).
 - (2) If low, dry motor engine for 30 seconds (Ref. 71-00-00, Maintenance Practices).
 - (3) Check oil level and replenish as necessary (Ref. 12-12-01).

- B. After more than 30 minutes duration, without complete loss of oil pressure
 - (1) Inspect L.P. compressor outlet guide vanes (Ref. 72-31-01, Inspection/Check).
 - (2) Inspect magnetic chip detectors (Ref. 72-01-00, Inspection/Check).
 - (3) Dry motor engine for 30 seconds (Ref. 71-00-00, Maintenance Practices).
 - (4) Check oil level and replenish as necessary (Ref. 12-12-01).

- C. After more than 30 minutes duration, with complete loss of oil pressure
 - (1) Inspect L.P. compressor outlet guide vanes (Ref. 72-31-01, Inspection/Check).
 - (2) Inspect magnetic chip detectors (Ref. 72-01-00, Inspection/Check).
 - (3) Dry motor engine for 30 seconds (Ref. 71-00-00, Maintenance Practices).
 - (4) Inspect magnetic chip detectors (Ref. 72-01-00, Inspection/Check).
 - (5) Check oil level and replenish as necessary (Ref. 12-12-01).
 - (6) Start engine and run at ground idle for 5 minutes then stop engine (Ref. 71-00-00, Maintenance Practices).



RB.211 Propulsion System

MAINTENANCE

- (7) Inspect magnetic chip detectors and fine scavenge filter (Ref. 72-01-00, Inspection/Check). If inspection is satisfactory the engine can continue in service.
- (8) Inspect magnetic chip detectors (Ref. 72-01-00, Inspection/Check) within 10 hours, preferably after next flight.

3. Inspection Following Engine Surge

CR
CR
CR

NOTE: Refer to 5-50-08, Inspection/Check and 71-99-00, Fault Isolation if the engine surge followed a bird strike or suspected bird strike.

All operations (3.A. through 3.F.) must be completed unless the engine is rejected.

C Step 3.E. may be deleted if engine is not shut down in flight.

A. Inspect L.P. Compressor

- (1) Visually inspect L.P. compressor for damage (Ref. 72-31-02, Inspection/Check).

B. Inspect Exhaust Transition Case and Cone

- (1) Inspect exhaust transition case and cone, and also L.P. turbine bearing support assembly spokes, for metal particles and metal spatter.
- (2) If any metal particles or metal spatter are found, inspect engine (Ref. 72-00-00, Inspection/Check) to establish source of particles or spatter. Accept or reject engine accordingly.

EFFECTIVITY: ALL

050B

1A

71-00-00

Page 604
Mar 15/91



RB.211 Propulsion System

MAINTENANCE

C. If surge occurred following bird strike (or suspected bird strike), the following procedure must be carried out before proceeding with post surge inspection.

- (1) Using boroscope equipment and procedure (Ref. 72-00-00, Inspection/Check, para.4), inspect H.P. compressor stage one rotor blades for damage (Ref. 72-34-00, Inspection/Check). If damage is within acceptable limits, inspect combustion liner metering panel for distortion and/or bowing (Ref. 72-40-00, Inspection/Check, Inspect Combustion Liners Following Bird Strike).

D. Inspect Magnetic Chip Detectors

- (1) Inspect magnetic chip detectors (Ref. 72-01-00, Inspection/Check).

E. Inspect Engine Internally

C This inspection may be deleted if engine is not shut down
C in flight.

At any stage of following inspections the operations to be effected are dependant on damage as follows:

Damage found - outside of limits - reject engine
Damage found - within limits - continue with next operation
No damage found - proceed to para.F.

- (1) Inspect stages 5 and 6 H.P. compressor rotor blades (Ref. 72-34-00, Inspection/Check).
- (2) If stage 5 and 6 H.P. compressor rotor damage is within limits, inspect stages 6 and 7 I.P. compressor rotor blades (Ref. 72-32-00, Inspection/Check).
- (3) If stage 6 and 7 I.P. compressor rotor damage is within limits, inspect stages 1 through 5 I.P. compressor rotor blades (Ref. 72-32-00, Inspection/Check).
- (4) If stages 1 through 5 I.P. compressor rotor damage is within limits, inspect stages 1, 2 and 3 H.P. compressor rotor blades (Ref. 72-32-00, Inspection/Check).



RB.211 Propulsion System

MAINTENANCE

- . C F. Open air intake adapter access door and visually inspect
C the interior of the S-duct
- C (1) Inspect the S-duct slip joints (ref. M.M.54-26-00,
C Figure 1, page 4, Details E and H) for evidence of
C dislodged bearing strips at the slip joints that may
C be protruding into the duct interior.
- G. Test Speed and Temperature Control Amplifier STA 102 (units
not incorporating Lucas Mod.CP.4935) or STA 104 (units not
incorporating Lucas Mod.CP.4935)

Lucas S.B.STA 102-73-30 (Mod CP.4935), Lucas S.B.
STA 104-73-4 (Mod.CP.4935) - Deletion of C.26 capacitor
from R.F.1 Suppression Circuit.

CAUTION: ENSURE ELECTRICAL CONNECTOR(S) ARE FREE FROM
LIQUID AND/OR SOLID CONTAMINATION BEFORE
DISCONNECTING/RECONNECTING. FAILURE TO DO
SO COULD RESULT IN A FIRE.

- C H. Place fuel control amplifier in override position (F/E's
C lower instrument panel). Install placard per MEL.
- C 1. Contact MCIMD/MCIMC to have amplifier changed within
C 25 hrs.
- C J. Visually check the compressor intermediate case for cracks
C between front and rear flanges at 5 o'clock position.
C Pay particular attention to the 5 o'clock position oil
C scavenge boss and H.P. borescope hole.
- C For - illustration of typical crack at 5 o'clock position,
C Reference Maintenance Manual 72-33-00, Inspection/Check.
C Not req'd on steel cases -
- C K. Deleted
- C L. Check fuel flow amplifier and N2 switch harness connectors
C for water or contamination.

4. Inspection Following Abandoned Take-Off

- C Deleted

R
R
050B

EFFECTIVITY: ALL

1A

71-00-00
Page 606
Mar 15/91



RB.211 Propulsion System

MAINTENANCE

R 5. Inspection Following Ingestion of Volcanic Ash

R The following actions must be effected on an engine following
R ingestion of volcanic ash. If the engine is rejected during
R the inspection, the remaining operations need not be
R completed.

R A. Check Dust Sample for Acidity/Alkalinity.

R NOTE: Contact Rolls-Royce Product Support Department, Derby
R for method of dust analysis.

R (1) If dust sample is neutral continue with operation B.

R (2) If dust sample is not neutral - reject engine for
R internal cleaning, preserve engine (Ref.71-00-00)
R prior to transportation to base.

R B. Check Engine Operating Parameters at Time of Incident

R (1) If operating limitations were not exceeded continue
R with operation C.

R (2) If operating limitations were exceeded continue with
R operation C but also effect Fault Isolation procedure
R for reported limitation(s) exceedance.

R EFFECTIVITY: ALL
R
050B

1A

71-00-00
Page 607
Nov 15/85



RB.211 Propulsion System

MAINTENANCE

C. Check Engine Oil System for Contamination.

- (1) Remove and inspect magnetic chip detectors (M.C.D.'s) and oil filter elements (Ref.72-01-00).
 - (a) If no contamination is found, drain and refill oil system and continue with operation (D).
 - (b) If contamination is found - reject engine

D. Check Engine Fuel System

- (1) Remove and inspect L.P. fuel filter element (Ref.73-11-02), H.P. fuel filter element (Ref.73-11-09) and FFR centrisep cleaner (Ref.73-21-04).
 - (a) If no contamination is found continue with operation E.
 - (b) If contamination is found in fuel filter elements:
Clean aircraft fuel tanks (28-11-00).
Change following units
L.P./H.P. fuel pumps (Ref.73-11-01),
L.P./H.P. F.C.O.C. (Ref.79-21-04), F.F.R. (Ref.73-21-01), Fuel flow transmitter (Ref.73-34-01), Starting F.F.R. (Ref.73-21-03), H.P.S.O.V. (Ref.73-11-04).
Flush all interconnecting fuel tubes.
Continue with operation (c).
 - (c) If contamination is found in centrisep cleaner, clean centrisep, change fuel flow regulator and continue with operation E.

R

E. Engine Air Control System

- (1) Change V.I.G.V. master ram and control unit, (Ref. 75-31-01).

EFFECTIVITY: ALL

050B

1A

71-00-00

Page 608
May 15/89



RB.211 Propulsion System

MAINTENANCE

F. Check Engine Internally

(1) Inspect combustion section, H.P.N.G.V.'s and H.P. turbine (Ref.72-00-00).

(a) If acceptance standards are not exceeded continue with operation (2).

NOTE: If blockage of airfoil film cooling holes due to build-up of fused deposits is seen during inspection, this can be accepted providing area is re-inspected after engine ground run at operation 'G'.

(b) If acceptance standards are exceeded - reject engine.

(2) Inspect H.P. and I.P. compressors (Ref.72-00-00).

(a) If acceptance standards are not exceeded continue with operation G.

(b) If acceptance standards are exceeded - reject engine.

G. Test Engine (Ref.71-00-00).

(1) Perform tests 4, 13 and 8

(a) If testing is satisfactory continue with operation (2).

(b) If test 4 is not satisfactory perform Shaft Speed Fault Isolation (Ref. 71-86-00).

(c) If test 13 is not satisfactory reject engine.

(d) If test 8 is not satisfactory perform Acceleration, Deceleration and Idle Fault Isolation (Ref. 71-84-00), continue with operation (2).

R

R

EFFECTIVITY: ALL

050B

1A

71-00-00
Page 609
May 15/87



RB.211 Propulsion System

MAINTENANCE

- R**
- (2) Remove and inspect M.C.D.'s and oil filter elements (Ref.72-01-00) and change fuel filter elements (Ref.73-11-02, 73-11-09).**
 - (a) If M.C.D and oil filter element inspection is satisfactory return engine to service.**
 - (b) If M.C.D. and oil filter element inspection is not satisfactory - reject engine.**

EFFECTIVITY: ALL

050B

1A

71-00-00
Page 610
May 15/87

 RB.211 Propulsion System
MAINTENANCE

POWER PLANT - CLEANING, PAINTING AND PRESERVATION

1. General

Engines, Q.E.C. units, and propulsion systems which are to be stored or transported require protection against entry of foreign matter and contact with atmosphere. Prior to storage they should be cleaned externally, any corrosion removed, and exposed metal reprotected.

Foreign matter is excluded by sealing off all apertures, and corrosion is prevented by inhibiting the engine and placing vapour phase inhibitor (V.P.I.) paper into the air intake and exhaust.

2. Cleaning

A. Cleaning Engine, Q.E.C. Unit or Propulsion System Prior to Preservation.

(1) Material required:

	British Spec./Ref.	American Spec./Ref.	OMat Item No.
White spirit:	B.S.245		102
or			
Stoddard solvent:		A.S.T.M. D484-52	1/5

- (2) Clean the engine, Q.E.C. unit or propulsion system externally with white spirit, ensuring that the white spirit does not accumulate in the engine air inlet or any apertures.**



RB.211 Propulsion System

MAINTENANCE

- (3) Examine all painted parts for chipping of enamel and signs of corrosion. If corrosion is found, remove and reprotect as detailed in 3. Painting.

B. Cleaning after Discharge of Aircraft Fire Extinguishers

WARNING: EXTINGUISHANT VAPOURS ARE TOXIC BOTH BY INHALING AND SKIN ABSORPTION. OBSERVE LOCAL HEALTH REGULATIONS.

- (1) Ensure the maximum amount of ventilation is provided.
- (2) Wearing protective gloves and eye-shields, open cowlings to drain off any small pockets of fluid that may have collected in the inner cowling recesses.
- (3) If the ambient temperature is too low for vapourization of the agent concerned, wipe away any fluid using a cloth, and dispose after use.
- (4) Allow 30 minutes for vapours to disperse.
- (5) Remove discharged fire extinguisher container(s) (26-21-00) and inspect feed tubes, discharge nozzle outlets and thermal discharge indicator tubes.

C. Cleaning after Discharge of Ground Fire Extinguishers

(1) Carbon dioxide

This is a non-corrosive inert gas and disperses without trace. It has no detrimental effect on the engine and no cleansing action is required.

(2) Dry powder

Where dry powder has been used, penetration of the powder internally to the high temperature components could result in the formation of a glaucous deposit which may unbalance the turbine assembly. If discharged into the engine, the powder combines with the lubrication oil to form a sludge. Whenever dry powder has been used proceed as follows:



RB.211 Propulsion System

MAINTENANCE

- (a) Visually inspect the fixed inlet guide vanes and variable inlet guide vanes of the I.P. compressor for any deposits of powder.
- (b) Visually inspect the hot stream exhaust collector and nozzle, and the final stage of the L.P. turbine for any glaceous deposits.
- (c) If inspection (a) and (b) indicate or there is any reason to suspect that powder has entered the engine, remove the engine. If there are no indications that powder has entered the engine, remove the powder by suction cleaner.

(3) Vapourizing chemical

In general, these liquids are non-corrosive to the metals on the engine but are injurious to rubber and plastics if left in contact with them for prolonged periods. The by-products produced by these liquids, when in contact with high temperature components, are extremely corrosive.

- (a) Observe the WARNING given in 2.B.
- (b) Wearing protective gloves, open the cowlings and allow the extinguishant to vapourize and disperse.
- (c) If the chemical has been discharged into the engine, perform a motoring cycle if practicable, to disperse any vapour or liquid remaining in inaccessible places.

After establishing the reason for using the fire extinguisher (e.g. internal engine fire) and if practicable, perform a ground run for 5 minutes at ground idle to eliminate the corrosive action.

(4) Foam

Where foam has been used, the possibility of corrosion can be minimized by promptly cleansing before the foam has solidified. Foam that is not removed forms a cream-coloured sludge, or a crust on hot surfaces.

Whenever foam has been used proceed as follows:



RB.211 Propulsion System

MAINTENANCE

- (a) Wash the engine externally and internally, as far as possible, with clean water. Continue washing until the water draining from the engine is free from foam traces.
- (b) If foam is discharged into the engine, the engine must be removed.

3. Painting

For painting aluminium or steel casings, and magnesium components, refer to 70-42-12.

4. Preservation of Main Line Bearings

A. Preservation of Main Line Bearings

It is recommended that the following procedure should be accomplished before the engine is removed from the aircraft providing the engine can be rotated without damage, by the starter motor. If the engine is to be rotated after removal from the aircraft, it must be installed in multi-purpose stand CP30000/17 or CP30860 or equivalent heavy stand.

R

Referenced Procedures:

12-12-01	Engine Oil Replenishment
71-00-00	Power Plant - Adjustment/Test
72-01-00	Oil System - Servicing

- (1) Drain engine oil tank (Ref. 72-01-00).
- (2) Replenish engine oil tank with 2.0 Imperial gallons 2.40 U.S. gallons, 9.10 Litres) of clean approved oil (Ref. 12-12-01).
- (3) Dry motor engine (Ref. 71-00-00) until oil pressure is indicated on flight station indicator. If motoring cycle is liable to exceed starter operating limitations (Ref. 71-00-00) before oil pressure is indicated, terminate motoring cycle. Ensure oil quantity in engine oil tank then effect another dry motoring cycle.

EFFECTIVITY: ALL

050B

1P

71-00-00
Page 704
Jun 15/93



RB.211 Propulsion System

MAINTENANCE

- . C B. Depreservation of Main Line Bearings
- C (1) Remove all moisture barriers.
- C (2) Drain engine oil tank into suitable container. Install
C and lock wire drain plug.
- C (3) Drain main gearbox oil into suitable container.
C Install and lock wire drain plug.
- C (4) Remove and replace main and scavenge oil filter.
- C (5) Engine must be subjected to an oil filter contamination
C test. Refer to Chapter 79 for procedure and accomplish
C M11-79-01.

C. Blank Off Engine, Q.E.C. Units, and Propulsion Systems.

(1) Material required:

	British Spec./Ref.	American Spec./Ref.	OMat Item No.
V.P.I. Impregnated paper	V.P.I.No.260	UU-P00270	1221
P.V.C. self adhesive tape	-	-	1228
Grease resistant paper	CS.21930	-	1226

R
R
050B

EFFECTIVITY: ALL

1P

71-00-00
Page 705
Nov 15/85



RB.211 Propulsion System

MAINTENANCE

(2) Blank off engine

- (a) Blank off all exposed apertures using the blanks shown in fig.703, (Sheets 1, 2 and 3) as applicable. Use grease resistant paper secured in position with P.V.C. self-adhesive tape at apertures where blanks are not available.
- (b) Blank any disconnected harness connectors and secure to an adjacent structure to avoid damage.
- (c) Before fitting the L.P. compressor case front cover or the nose cowl cover, the front of the I.P. compressor rotor with V.P.I. paper. The sheets should be slightly crumpled to hold them in position, with the coated side towards the compressor.
- (d) Before fitting the L.P. fan exhaust cover, cover the rear of the L.P. compressor outlet guide vanes with V.P.I. paper. The coated side of the paper should be towards the outlet guide vanes.
- (e) Before fitting the exhaust collector cover, place sheets of slightly crumpled V.P.I. paper between the exhaust cone and transition case, with the coated side towards the turbines.

R
R

(3) Maximum neutral Q.E.C. unit blanks

- (a) Refer to Fig.703, (Sheets 1, 2 and 3) blank off all apertures using blanks (2), (3), (4), (5), (7), (8) and (13) through (21). Use grease resistant paper secured in position with P.V.C. self-adhesive tape at apertures where blanks are not available.

- (b) Accomplish operation (2), (b).

(4) Wing mounted Q.E.C. Unit blanks.

- (a) Refer to Fig.703, (Sheets 1, 2 and 3) blank off all exposed apertures using blanks (2), (3), (4), (5), (8), (13), (14), (15), (17), (21). Any apertures for which blanks are not available, use grease resistant paper secured in position with P.V.C. self-adhesive tape.

- (b) Accomplish operations (2), (b).

EFFECTIVITY: ALL

0508

1P

71-00-00
Page 706
Nov 15/88



RB.211 Propulsion System

MAINTENANCE

D. Inhibit the Engine Fuel System

(1) Equipment required:

Clean receptacle - minimum capacity

5 U.S. gallons

4 Imperial gallons

18 Litres.

Flexible hose - approximate length 72 in. (1800 mm.)
0.5 in. (12 mm.)

(2) Material required:

Inhibiting fluid:	British spec. D.T.D. 5578	American spec. MIL-L-7870A
	or D.Eng.R.D.2490	or MIL-L-6081C ASG (grade 1010)

Stainless steel locking wire: British gauge - 22 S.W.G.
American gauge - 21 A.W.G.

Dry compressed air supply - minimum pressure 60 p.s.i.g.

(3) Prepare Engine for Inhibiting

- Open left-hand hinged cowl, 413A or 423A for engines No.1 and 3 (Ref. 71-11-00) or 433AL for engine No.2 (Ref. 71-12-01).
- Open relevant circuit breakers to isolate electrical supply to ignition system.
- Refer to A, fig.701, (Sheet 1) position clean receptacle then remove drain plug and drain L.P. fuel supply tube.
- Fit and lubricate (Ref. 70-02-01) a new seal ring to drain plug.
- When fuel flow ceases, fit and secure drain plug then wirelock.

R EFFECTIVITY: ALL

050B

71-00-00
Page 707
Nov 15/85

1P



RB.211 Propulsion System

MAINTENANCE

(f) Engines without S.B.73-4473

- (i) Refer to B, fig.701, (Sheet 1) attach flexible hose to L.P. filter drain valve outlet and position free end of hose in clean receptacle.
- (ii) Depress drain valve handle, rotate anti-clockwise through 90 degrees, and drain L.P. fuel system.

(g) Engines with S.B.73-4473

- (a) Refer to B, fig.701, (Sheet 1) position receptacle then remove drain plug from L.P. fuel filter.
- (b) Fit and lubricate (70-02-01) new seal ring to drain plug.
- (h) Refer to fig.701, (Sheet 2) disconnect L.P. fuel supply tube at engine/aircraft interface.
- (i) Connect adapter to engine fuel supply tube.
- (j) Connect inhibiting rig delivery hose to adapter.
- (k) Position clean receptacle under drain outlet in gas generator turbine section lower fairing.
- (l) Connect and engage external power system (Ref. 24-41-00).

(4) Inhibit Engine Fuel System - Motoring Method

- (a) Connect supply of slushing oil TWA Stk. Nbr. 50-0842 to inlet of fuel pump.
- (b) On engines without S.B.73-4473, when fuel free inhibiting fluid flows from L.P. filter drain valve, close valve by depressing handle and rotating clockwise through 90 degrees and then releasing Remove hose.
- (c) On engines with S.B.73-4473, when fuel free inhibiting fluid flows from L.P. filter drain, fit and secure drain plug and wirelock.
- (d) Select FUEL AND IGNITION switch, zone 215, ON.



RB.211 Propulsion System

MAINTENANCE

(e) Motor engine (Ref. 71-00-00) and move FUEL AND IGNITION switch to ENRICH position and hold.

(f) When fuel free inhibiting fluid flows from turbine section drain move FUEL AND IGNITION switch to OFF position. Continue to motor engine for a further 5 seconds then cancel motoring cycle (Ref. 71-00-00 Adjustment/Test) and close supply of slushing oil.

CAUTION: OBSERVE STARTER DUTY CYCLE.

(5) Inhibit Engine Fuel System - Hand Turning Method

(a) Prepare engine H.P. system for hand turning (Ref. 72-00-00).

(b) Ensure relevant circuit breakers are open to isolate electrical supply to ignition system.

(c) Connect supply of slushing oil TWA Stk Nbr. 50-0842 to inlet of fuel pump.

(d) On engines without S.B.73-4473, when fuel free inhibiting fluid flows from L.P. filter drain valve, close valve by depressing handle and rotating through 90 degrees and then releasing. Remove hose.

(e) On engines with S.B.73-4473, when fuel free inhibiting fluid flows from L.P. filter drain, fit and secure drain plug and wirelock.

(f) Move FUEL AND IGNITION switch to ENRICH position and hold.

(g) Turn engine H.P. compressor system, using hand turning tool until fuel free inhibiting fluid flows from turbine section drain.

(h) Move FUEL AND IGNITION SWITCH to OFF and continue hand turning and inhibiting for a further 30 seconds then close supply of slushing oil.

(i) Remove hand turning tool (Ref. 72-00-00).

R EFFECTIVITY: ALL

050B

71-00-00

Page 709
Nov 15/85

1P



BB.211 Propulsion System

MAINTENANCE

H. Inhibit Engine Fuel System - Engine Unturnable

- (1) Proceed as detailed in 5. (a) through (f) disregarding references to hand turning engine H.P. compressor system.

I. Disconnect Inhibiting Oil Supply

- C
C
- (1) Refer to Fig.701 (Sheet 2) disconnect hose from adapter.
 - (2) Remove adapter from engine fuel supply tube.
 - (3) Fit and lubricate (Ref. 70-02-01) new seal ring to L.P. fuel supply tube then connect and secure supply tube at engine/aircraft interface. Torque tighten bolts and nuts to between 80 and 100 lb.in.
 - (4) Close left-hand hinged cowl, 413A or 423A for engines No.1 and 3 (Ref. 71-11-00, Servicing) or 433AL for engine No.2 (Ref. 71-12-01, Servicing).
 - C (5) Close circuit breakers opened in operation (3) (b).

C J. Fuel System Depreservation

- C
C
- (1) Open relevant circuit breakers to isolate electrical supply to ignition system.
 - C (2) Motor engine and move fuel and ignition switch to ENRICHMENT position and hold.
 - C (3) When fuel free of inhibiting fluid flows from turbine drain move fuel and ignition switch to off position. Continue to motor engine for a further 5 seconds then cancel motoring cycle.
- C
- CAUTION: OBSERVE STARTER DUTY CYCLE
- CR
C
- (4) Remove preservation tags and make proper entry in engine records.

EFFECTIVITY: ALL

050B

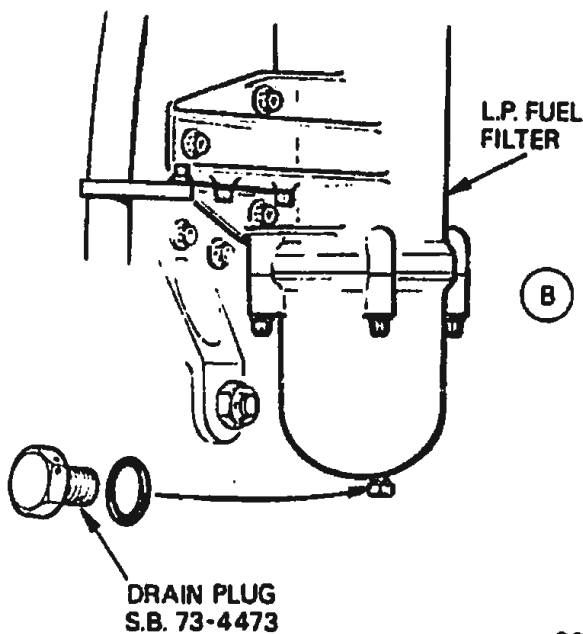
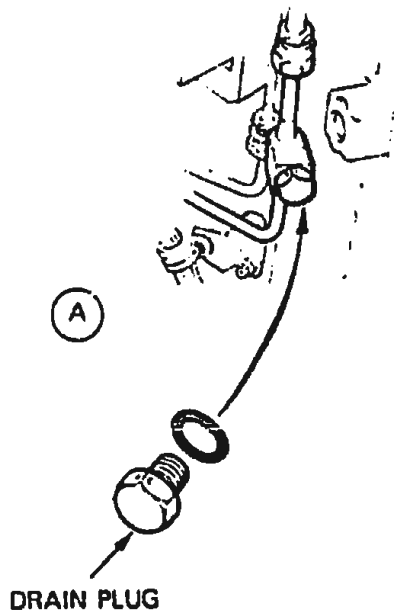
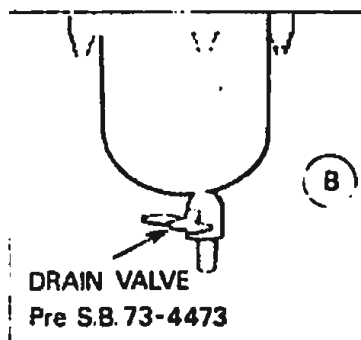
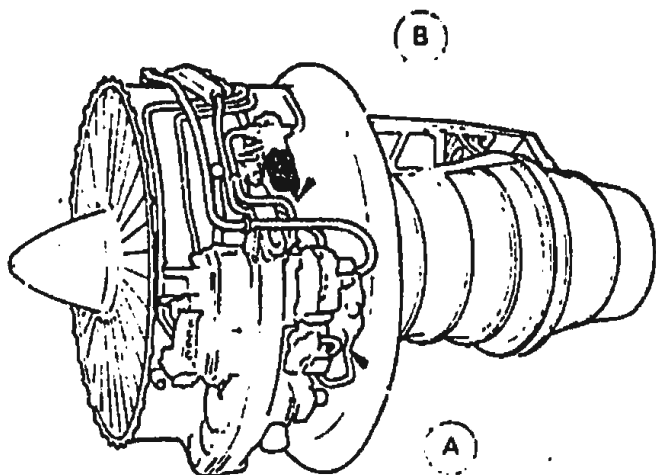
1P

71-00-00
Page 710
Nov 15/88



RB.211 Propulsion System

MAINTENANCE



36177A

R
R

Fuel System drain points
Fig.701 (Sheet 1)

EFFECTIVITY: ALL

050B

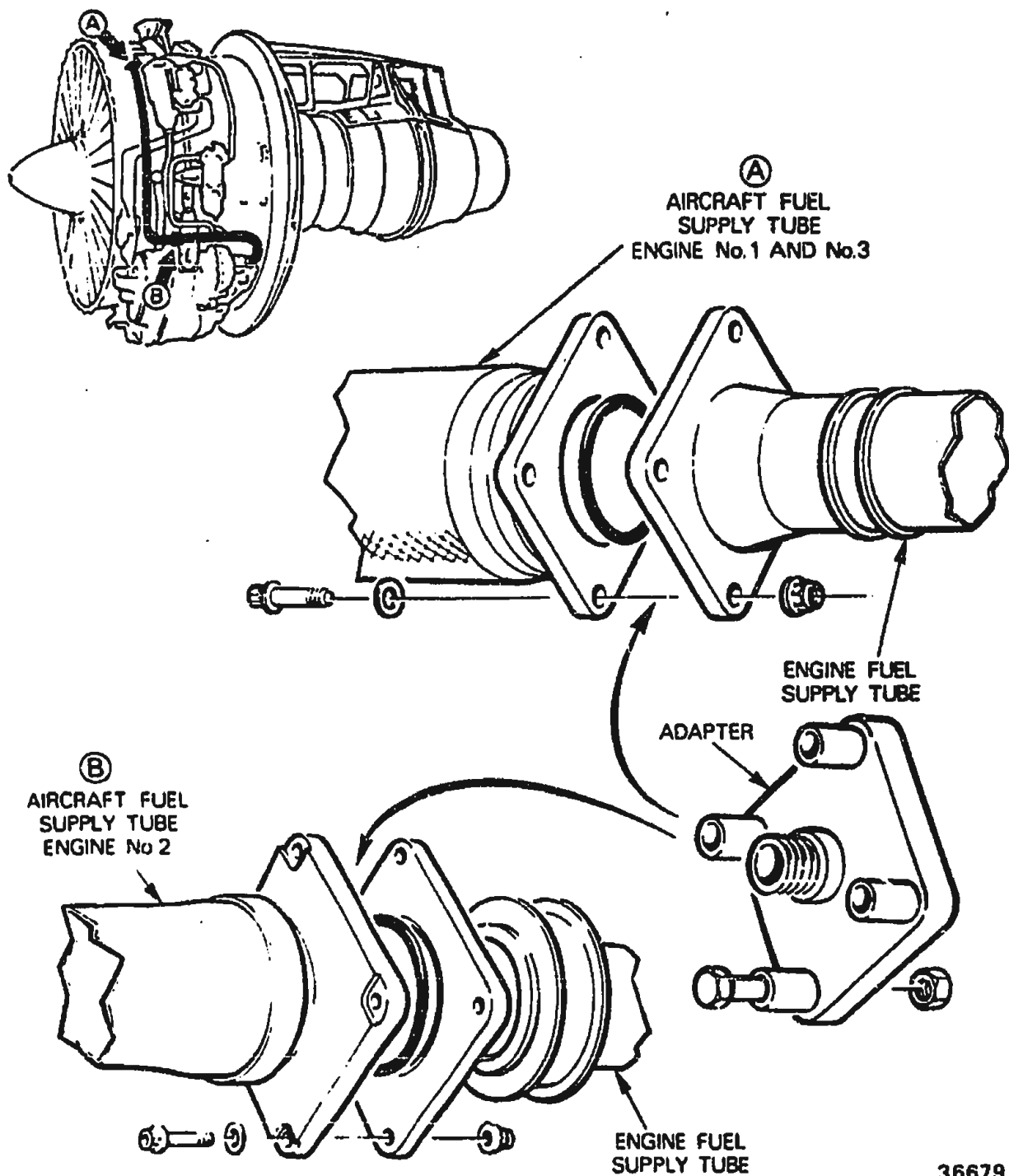
1P

71-00-00
Page 711
Feb 15/82



RB.211 Propulsion System

MAINTENANCE



36679

R
R

Fuel System drain points
Fig.701 (Sheet 2)

EFFECTIVITY: ALL

0508

1P

71-00-00

Page 712
Feb 15/82



RB.211 Propulsion System

MAINTENANCE

. C

Figure 702 deleted

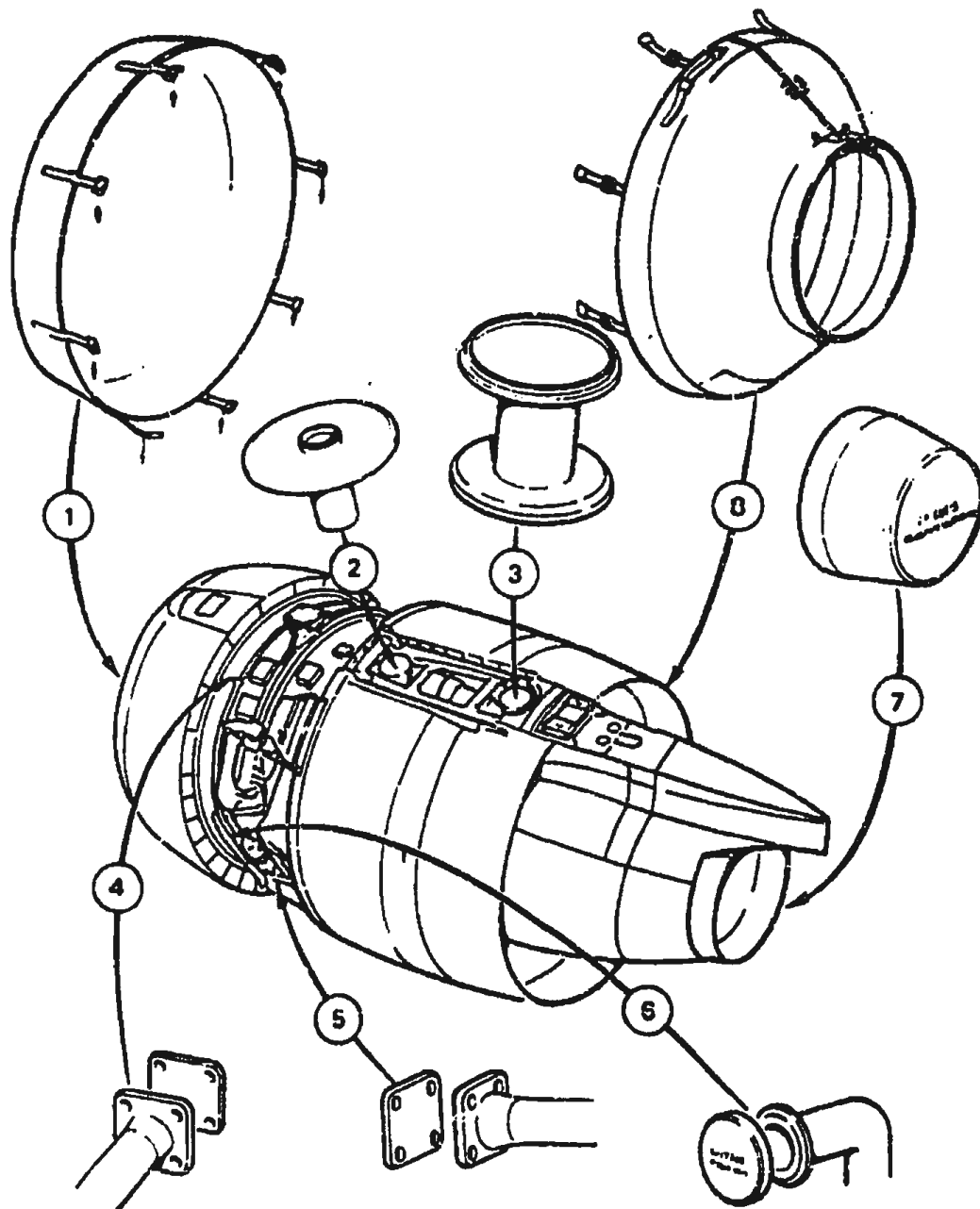
R
R
050B

EFFECTIVITY: ALL

1P

71-00-00
Page 713
Nov 15/85

RB.211 Propulsion System
MAINTENANCE



Blanks and covers are numbered for reference to Fig.704

42060

Engine blanking
 Fig.703 (Sheet 1)

R
 R
 050B

EFFECTIVITY: ALL

1P

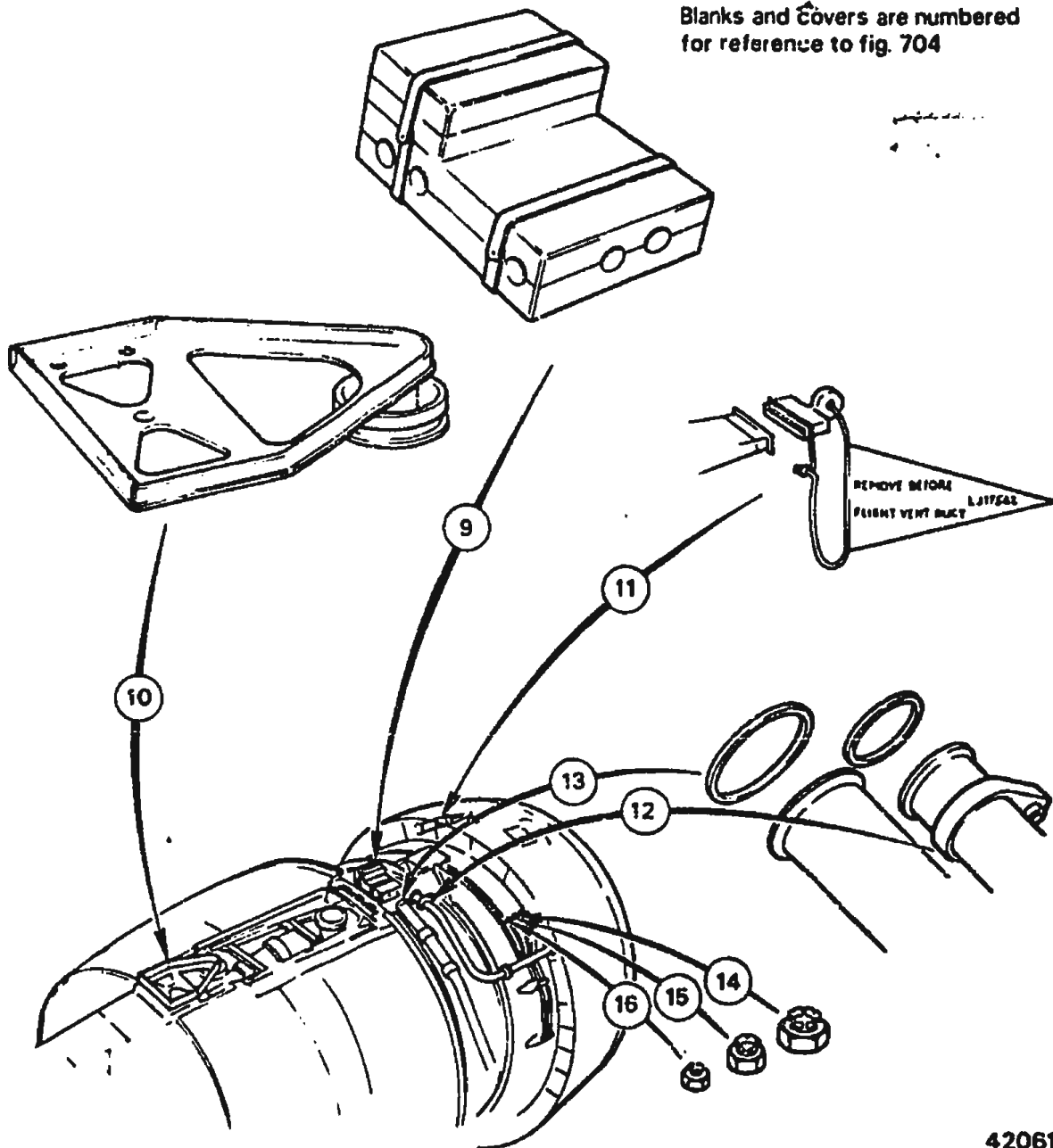
71-00-00
 Page 714
 Feb 15/82



RB.211 Propulsion System

MAINTENANCE

Blanks and Covers are numbered
for reference to fig. 704



Engine blanking
Fig.703 (Sheet 2)

R
R
0508

EFFECTIVITY: ALL

1P

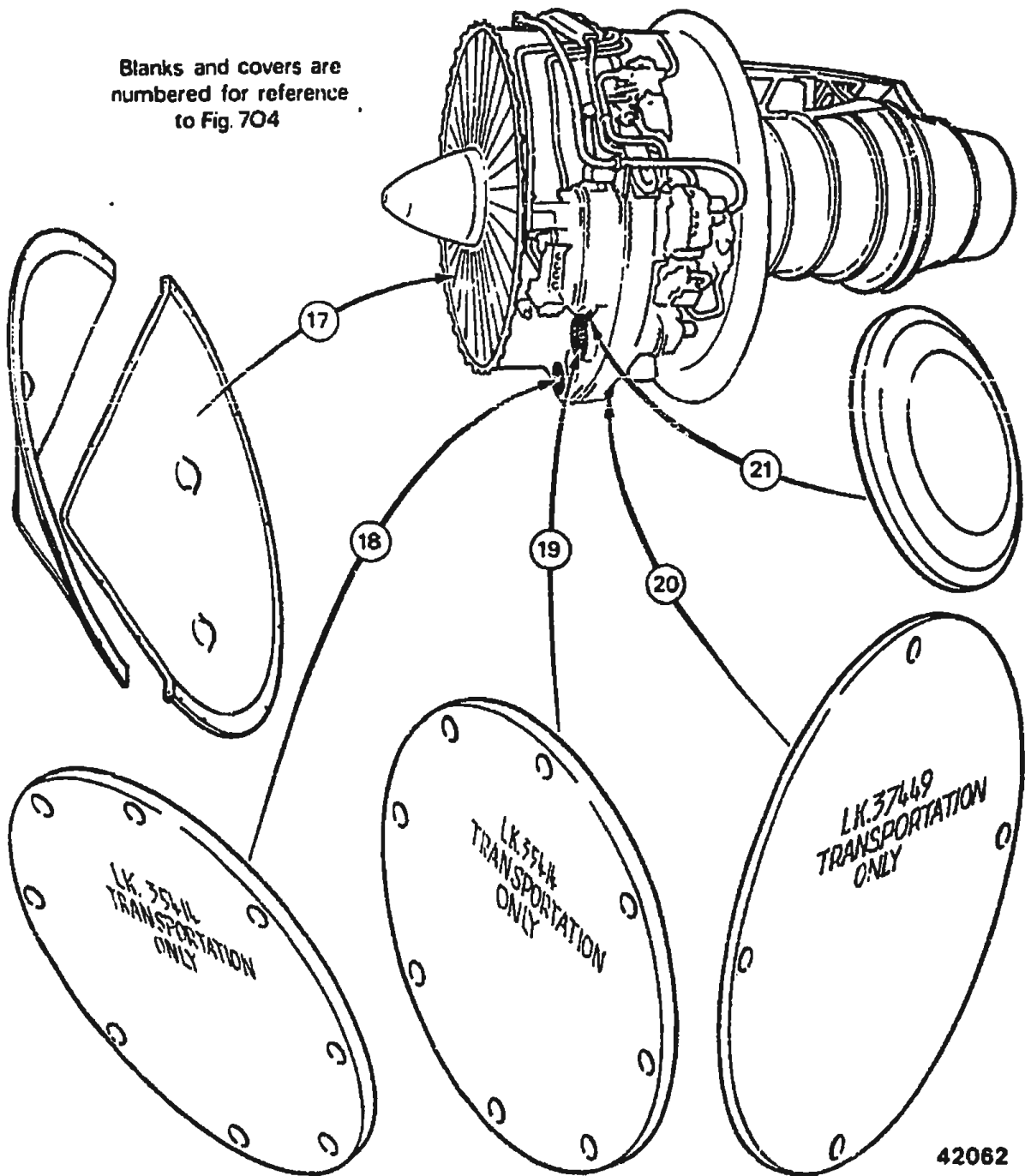
71-00-00
Page 715
Feb 15/82



RB.211 Propulsion System

MAINTENANCE

Blanks and covers are
numbered for reference
to Fig. 704



Engine blanking
Fig.703 (Sheet 3)

R
R
050B EFFECTIVITY: ALL

71-00-00
Page 716
Feb 15/82

1P



RB.211 Propulsion System

MAINTENANCE

- | | |
|---|---|
| 1. Cover - Nose cowl | LJ21903 or LJ27986 |
| 2. Blank - I.P. duct | LJ20188 |
| 3. Make-up piece H.P. - H.P. air shut off valve | LK53355 |
| 4. Cover - Fuel tube/pylon interface | LJ17359 |
| 5. Cover - Fuel tube/pylon interface | LJ17359 |
| 6. Cover - Wheelcase breather | LJ17360 |
| 7. Cover - Exhaust collector | LJ15790 (Pre S.B.78-3551)
LJ30950 or LK66815 (S.B.78-3551) |
| 8. Cover - L.P. fan exhaust (Pre S.B.71-5573)
or (S.B.71-5573) | LJ27260
LJ29825 |
| 9. Box - Harness support comprising: | LJ20023
LJ20024
LJ20025
LJ20026 |
| 10. Blank - H.P. duct | LJ20181 |
| 11. Blank - Ventilation duct | LJ17562 |
| 12. Cover - Anti-icing interface | LJ17357 |
| 13. Cover - Starter air duct | LJ17358 |
| 14. Blank - Hydraulic | LJ17363 |
| 15. Blank - Hydraulic | LJ17554 |
| 16. Blank - Hydraulic | LJ17555 |
| 17. Cover - L.P. compressor case front | LJ35270 |
| 18. Cover - Hydraulic pump mounting face | LK35414 |
| 19. Cover - Starter mounting face | LK35414 |
| 20. Cover - I.D.G. mounting face | LK37449 |
| 21. Cover - Oil accessory drain tube | LK36760 |

Transportation blanks
Fig.704

EFFECTIVITY: ALL

050B

1P

71-00-00
Page 717/718
Jun 15/93

LOCKHEED
MAINTENANCE MANUAL

WING-MOUNTED QEC UNIT - REMOVAL AND INSTALLATION

1. Equipment and Materials

Containers (approved for fuel, oil, and hydraulic fluids)

Plastic protective caps

Oil Service Cart, Model 550 LPT, Loe Industries, or equivalent

Antiseize compound

Engine Installation Tool Kit, PN BC55, or equivalent

Wing Engine Sling, PN 673290, or equivalent

Bootstrap Hoisting Assembly No. 1 or 3 Engine, PN BF78, or equivalent

Overhead crane (10-ton) or equivalent

Engine Cowl Panel Dolly, PN B872, or equivalent

Engine Cowl Panels Sling Set, PN B674, or equivalent

Engine Power Control Rigging Kit, PN B996, or equivalent

R Multipurpose Engine Stand, PN CP30000/12/13/17 or CP30860/1, Rolls-Royce Ltd., or equivalent

Transportation Base, PN CP30011/4, Rolls-Royce Ltd., or equivalent

Adapter Kit Hoist, PN CP30010 or CP30058 or CP30620, Rolls-Royce Ltd., or equivalent

Splitter Area Access Work Platform, PN CP20309 or XUT 37594 or (XUT 42526 and XUT 42527), Rolls-Royce Ltd., or equivalent

R Drawbar/axle assembly (used with CP30000/12/13/17 or CP30860/1) PN CP30139/2 or CP30515/1 Rolls-Royce Ltd., or equivalent

Tow bar (used with CP30515/1) PN CP30516 Rolls-Royce or equivalent

Engine Mounts Alignment Pins, PN BM35-101, or equivalent

Glove Fairing Locator, PN BG08, or equivalent

Lock-wire, Fed Spec QQ-W-390, 0.032-inch diameter, or equivalent

EFFECTIVITY: ALL

001B

71-00-01
Page 401
Dec 15/93

LOCKHEED
MAINTENANCE MANUAL

Lubricant, MIL-T-5544, or equivalent

2. Referenced Procedures

6-40-00	Exterior Access Doors and Panels
6-50-00	Interior Access Doors and Panels
7-11-00	Jacking Aircraft at Wing and Fuselage - Maintenance Practices
10-20-00	Mooring - Maintenance Practices
12-12-01	Engine Oil Replenishing - Servicing
12-12-11	Engine Starter Oil Replenishing - Servicing
12-12-21	Integrated Drive Generator (IDG) Oil Replenishing - Servicing
12-12-71	Thrust Reverser Air Motor - Servicing
20-36-02	Double T-Bolt V-Band Coupling - Removal and Installation
24-11-01	IDG Assembly - Adjustment and Test
24-41-00	External Power/Ground Service System - Maintenance Practices
26-21-01	Extinguisher Container - Inspection and Check
28-24-00	Engine Feed System - Adjustment and Test
28-24-07	Firewall Shutoff Valve, Engine No. 1 and 3 - Adjustment and Test
29-11-00	Hydraulic Power System
29-11-07	Engine-Driven Hydraulic Pump - Removal and Installation
29-11-32	Hydraulic Firewall Shutoff Valve - Adjustment and Test
54-00-00	Structural Repair Manual
54-11-01	Wing Pylon Box Structure - Removal and Installation
70-51-00	Torque Tightening Technique

R
R
001B

EFFECTIVITY: ALL

71-00-01
Page 402
Jun 15/93



MAINTENANCE MANUAL

71-00-00	Power Plant - Maintenance Practices
71-00-01	Wing-Mounted QEC Unit - Maintenance Practices
71-11-01	Left-Hand Hinged Cowl - Removal and Installation
71-11-02	Right-Hand Hinged Cowl - Removal and Installation
72-01-00	Oil System - Cleaning and Painting
72-03-05	RB211 IPC
73-21-00	RB211 IPC
72-03-00	Gas Generator Fairings - Removal and Installation
75-21-04	Air Inlet Shutoff Valve (Zone No. 1) Engines No. 1 and 3) - Adjustment and Test
78-31-20	Deflector Vane (Cascade) - Maintenance Practices

3. Removal/Installation

If an operator suspects that corrosive attack of main line bearings may occur during the period between engine removal and introduction into the overhaul shop, it is recommended that before the engine is removed from the aircraft the Cleaning/Painting procedure is accomplished (Ref. 72-01-00).

A. Removal (Bootstrap)

- (1) Check status of aircraft systems for engine removal as follows:
 - (a) Ground aircraft to an approved grounding lug.
 - (b) Provide electrical power (Ref. 24-41-00) as required.
 - (c) Position applicable power control lever, zone 210, in fully retarded (ground idle) position. Ensure that thrust reverser lever is fully forward in ground idle position.
 - (d) Depressurize applicable (A or D) hydraulic system and placard hydraulic system panels (Ref. 29-11-00).



MAINTENANCE MANUAL

CAUTION: THE FIRE EXTINGUISHING AGENT DISCHARGE SWITCH IS EXPOSED AND ARMED WHEN THE FIRE EMERGENCY ENGINE SHUTOFF CONTROL HANDLE HAS BEEN PULLED. DO NOT ACTUATE DISCHARGE SWITCH.

- (e) On the pilots overhead panel, zone 210, pull the applicable engine fire emergency shutoff control to close the firewall fuel and hydraulic shutoff valves (Ref. 28-24-07 and 29-11-32).

CAUTION: ENSURE CIRCUIT BREAKERS L3, H16 AND H18 ON PILOTS OVERHEAD CIRCUIT BREAKER PANEL ARE OPEN TO PREVENT INADVERTENT DEPLOYMENT OF THE RAM AIR TURBINE.

- (f) On pilots overhead circuit breaker panel CB1, zone 210, open and tag applicable circuit breakers FIRE EXTINGUISHER MAIN and ALTN (C10 and C11, or C14 and C15), RAT AUTO DEPLOY (L3), and THRUST REVERSE (H16 or H18), FUEL SHUTOFF VALVE-TANK-ENG 1 (D10) or ENG 3 (D12), and HYD PUMP & FIREWALL SHUTOFF VALVE CONT SYS A (L15) or SYS D (L18).
- (g) Ensure that main landing gear wheels are chocked and all landing gear downlock safety pins are installed.
- (h) Provide support, as necessary, for proper balance of aircraft (Ref. 7-11-00 and 10-20-00) during engine removal.
- (i) Position workstands and platforms as required.
- (2) Remove applicable LH and RH hinged cowls, 413A and 414A or 423A and 424A, (Ref. Fig. 401), using floor crane and engine cowl panel sling set (Ref. 71-11-01 and 71-11-02). Place cowls on engine cowl panel dolly (Ref. Fig. 402).
- (3) Remove the following fairings and panels (Ref. Fig. 403), zone 410 or 430 (Ref. 6-40-00 and 6-50-00):
- (a) Nose fairing aft panel, 451BT or 461BT
 - (b) Nose fairing forward panel, 451AT or 461AT
 - (c) Forward leading edge panel, 452AT or 462AT
 - (d) Interface box system door, 451TZ or 461TZ
 - (e) Cover, 451VZ or 461VZ

EFFECTIVITY: ALL

001B

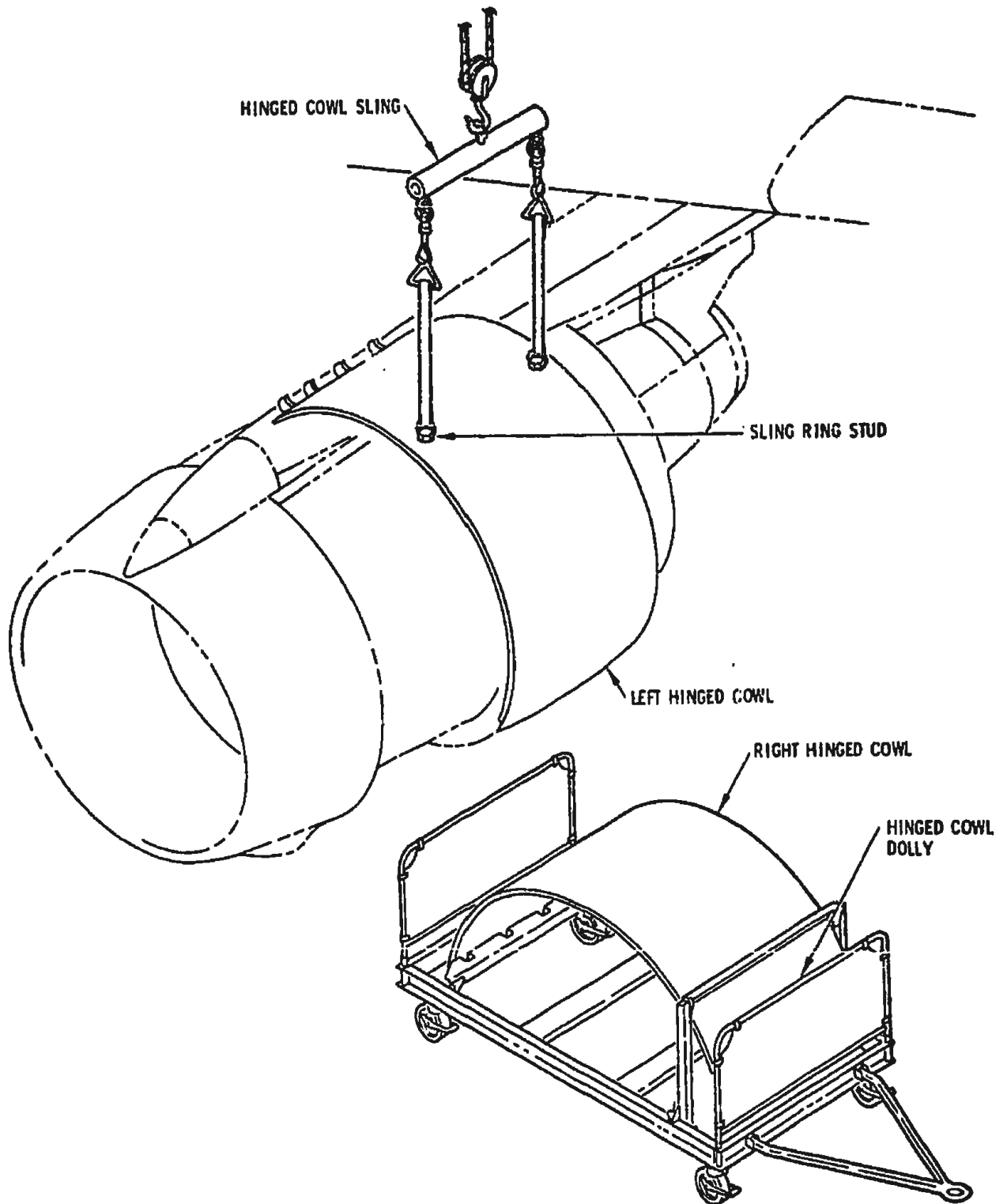
71-00-01
Page 404
Jun 15/96



RR

EFFECTIVITY: ALL

LOCKHEED
MAINTENANCE MANUAL



M1-0101-71-422

R
R

Wing QEC Hinged Cowl Sling and Dolly
Figure 402

EFFECTIVITY: ALL

001B

71-00-01
Page 407
May 15/77

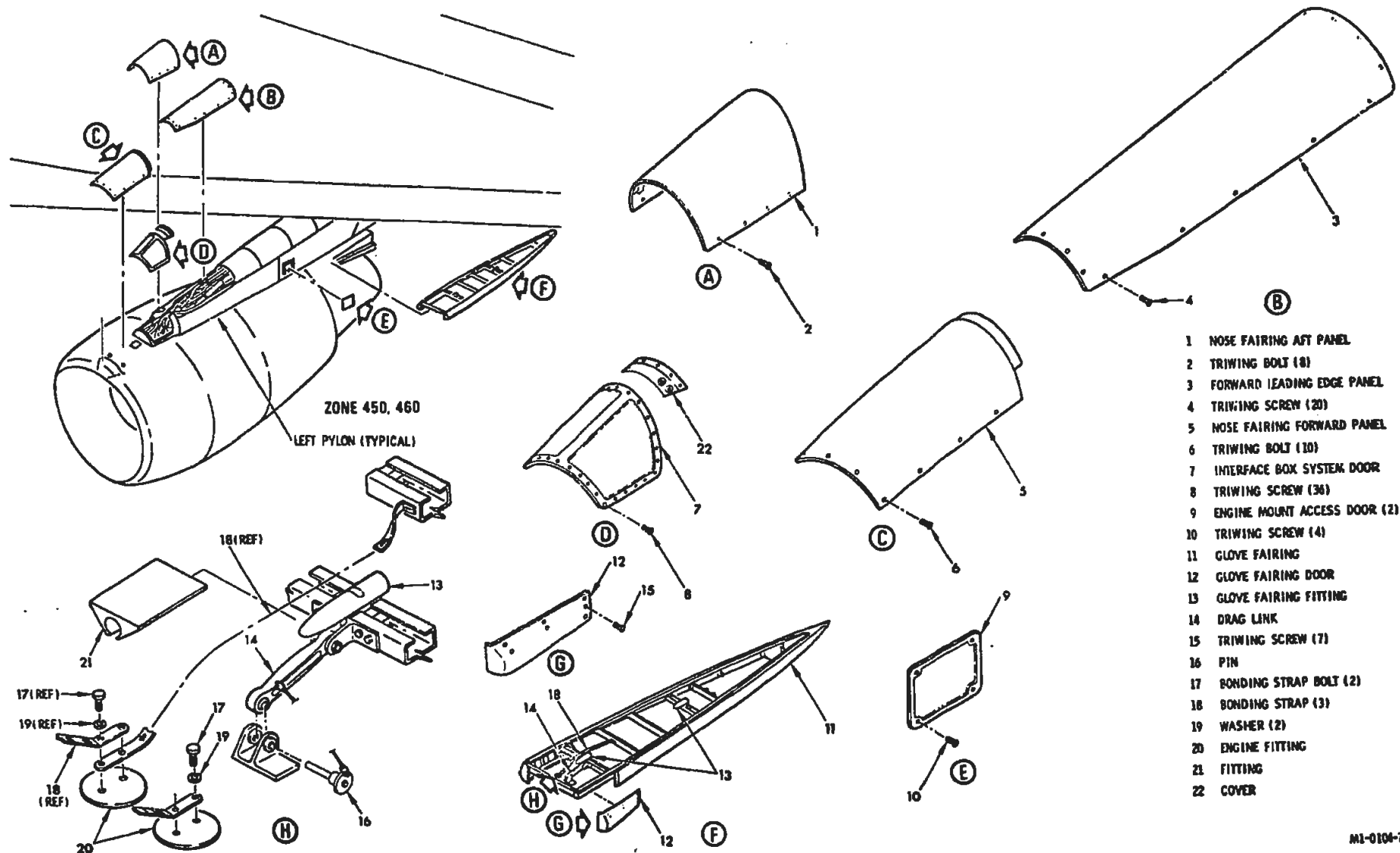


MAINTENANCE MANUAL

- (f) Engine mount access doors, 452DL and 452DR, or 462DL and 462DR
- (g) Glove fairing doors, 453AL and 453^{AR}AR, or 463AL and 463AR
- (4) Disengage hinged cowl support structure (Ref. Fig. 404), zone 451 or 461, by removing the retaining pins.
- (5) Remove starter duct section (Ref. Fig. 405), zone 451 or 561, by removing the double T-bolt V-band couplings (Ref. 20-36-02).
- (6) Disconnect the intermediate-pressure (IP) duct (Ref. Fig. 406), zone 415 or 425, by removing the double T-bolt V-band coupling (Ref. 20-36-02).
- (7) Disconnect IP duct seal (Ref. Fig. 406), zone 415 or 425, at pylon firewall.
- (8) Position splitter access platform (Ref. Fig. 407), in cold-stream exhaust collector nozzle, zone 435.
- (9) Remove interservices fairing LH and RH access panels, and LH and RH rear access panels to allow access to high-pressure (HP) duct disconnect (Ref. 72-03-00).
- (10) Disconnect support cable that connects high-pressure (HP) duct to the thrust reverser (TR) duct.
- (11) Disconnect the HP duct hoop plate seal and coupling (Ref. Fig. 406), zone 415 or 425, by removing the hoop plate seal clamp and HP duct double T-bolt V-band coupling (Ref. 20-36-02).
- (12) Disconnect glove fairing linkage bonding straps (Ref. Fig. 403).
- (13) Disconnect glove fairing drag link and remove glove fairing.
- (14) Disconnect engine interface linkage rods from torque shaft assembly by removing cotter pins, nuts and bolts (Ref. Fig. 408). Stow linkage rods for QEC unit removal. Do not remove the upper bushing, lower bushing or lock-wire.

NOTE: The upper bushing is held in place by the lock-wire, after the bolt has been removed, and may be adjusted slightly for installation or removal of the linkage rod. The lower bushing is threaded and should not be moved.

LOCKHEED
MAINTENANCE MANUAL



- 1 NOSE FAIRING AFT PANEL
- 2 TRIWING BOLT (8)
- 3 FORWARD LEADING EDGE PANEL
- 4 TRIWING SCREW (20)
- 5 NOSE FAIRING FORWARD PANEL
- 6 TRIWING BOLT (10)
- 7 INTERFACE BOX SYSTEM DOOR
- 8 TRIWING SCREW (36)
- 9 ENGINE MOUNT ACCESS DOOR (2)
- 10 TRIWING SCREW (4)
- 11 GLOVE FAIRING
- 12 GLOVE FAIRING DOOR
- 13 GLOVE FAIRING FITTING
- 14 DRAG LINK
- 15 TRIWING SCREW (7)
- 16 PIN
- 17 BONDING STRAP BOLT (2)
- 18 BONDING STRAP (3)
- 19 WASHER (2)
- 20 ENGINE FITTING
- 21 FITTING
- 22 COVER

M1-0104-71-01

R
R

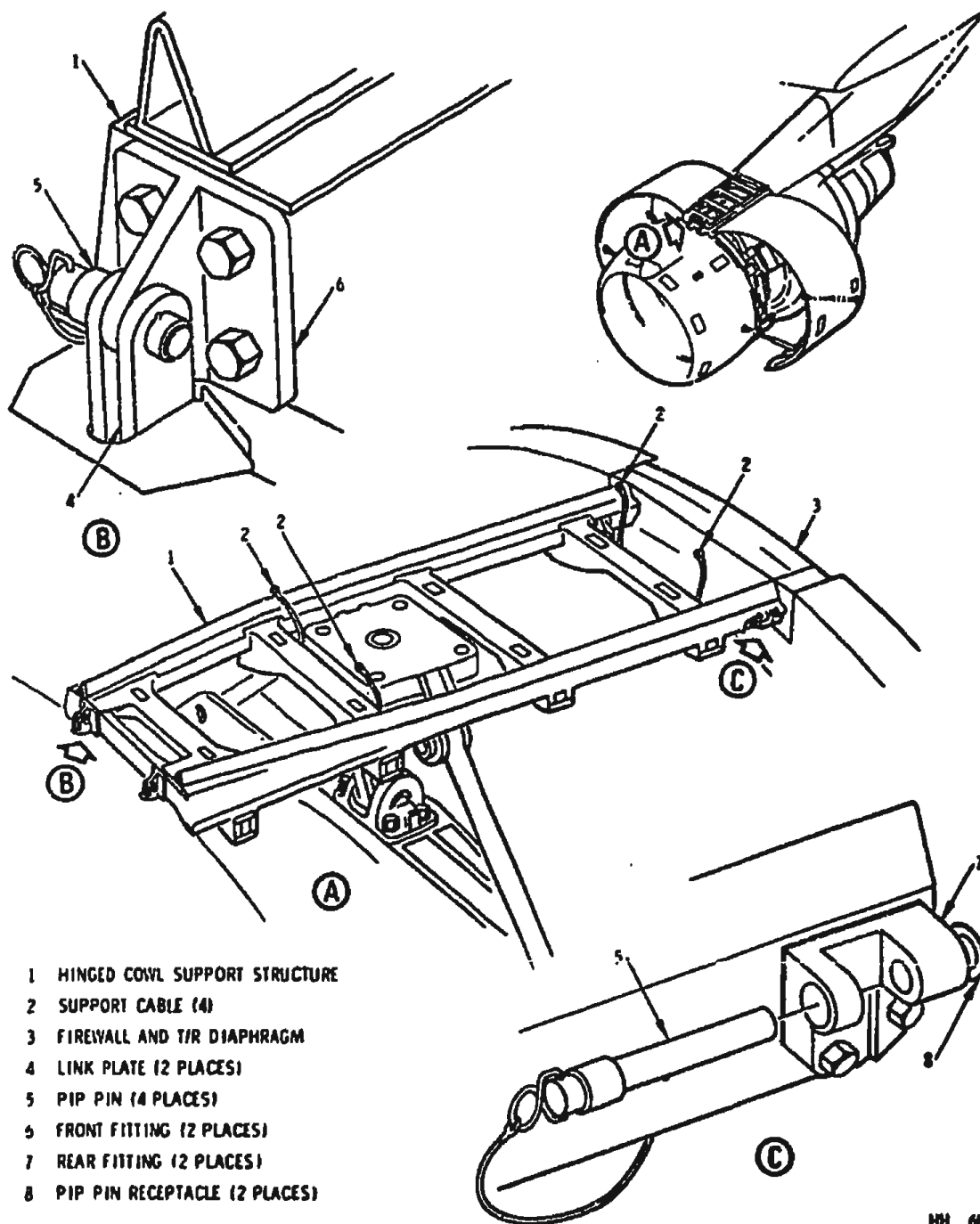
Wing QEC Fairings and Panels
Figure 403

EFFECTIVITY: ALL

001B

71-00-01
Page 409/410
Feb 15/79

LOCKHEED
MAINTENANCE MANUAL



- 1 HINGED COWL SUPPORT STRUCTURE
- 2 SUPPORT CABLE (4)
- 3 FIREWALL AND T/R DIAPHRAGM
- 4 LINK PLATE (2 PLACES)
- 5 PIP PIN (4 PLACES)
- 6 FRONT FITTING (2 PLACES)
- 7 REAR FITTING (2 PLACES)
- 8 PIP PIN RECEPTACLE (2 PLACES)

HH 6044
M1-A00-71-432

R
R

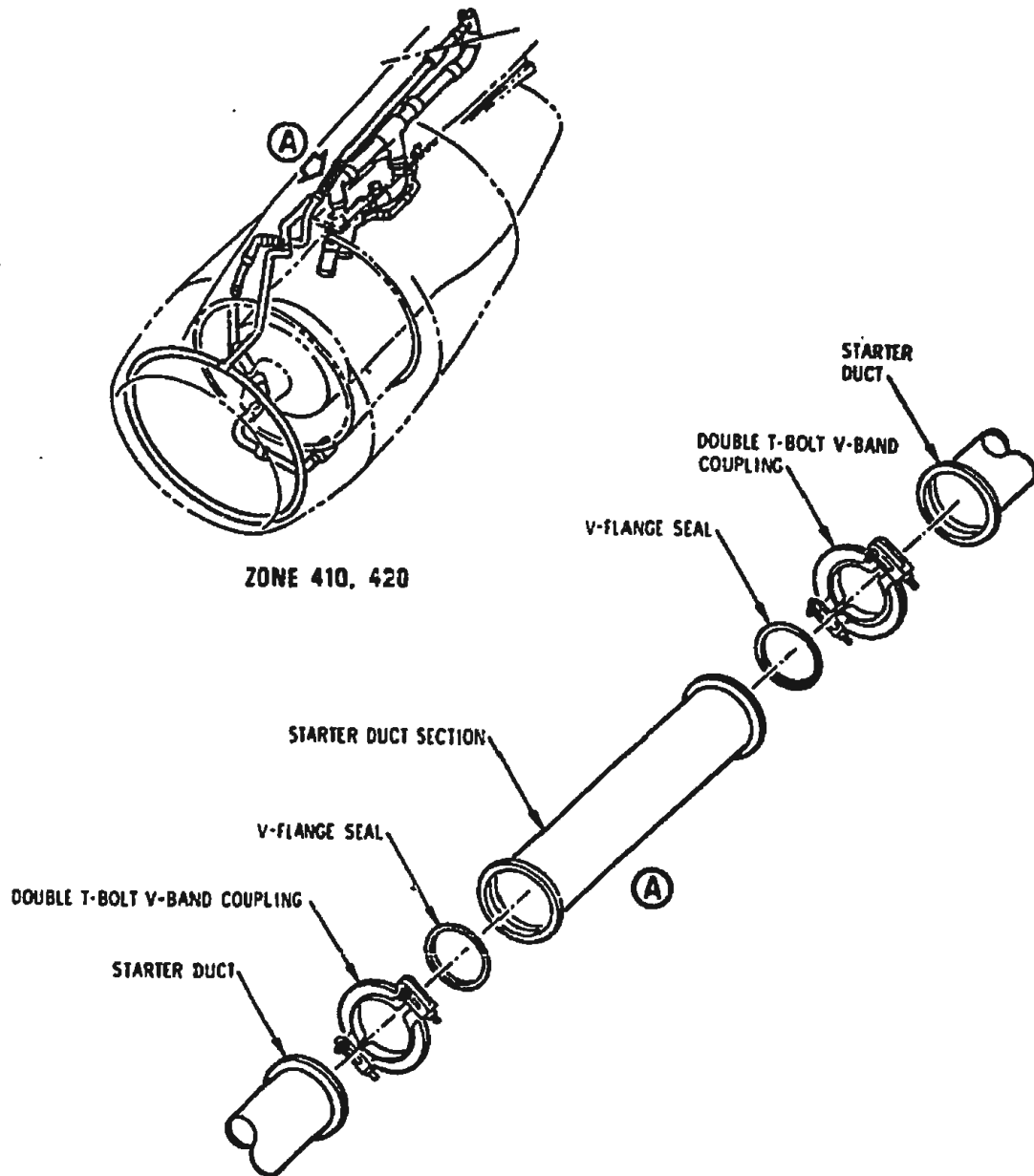
Hinged Cowl Support Structure
Figure 404

EFFECTIVITY: ALL

001B

71-00-01
Page 411
May 15/77

LOCKHEED
MAINTENANCE MANUAL



181 6136
M1-0101-71-03

R
R

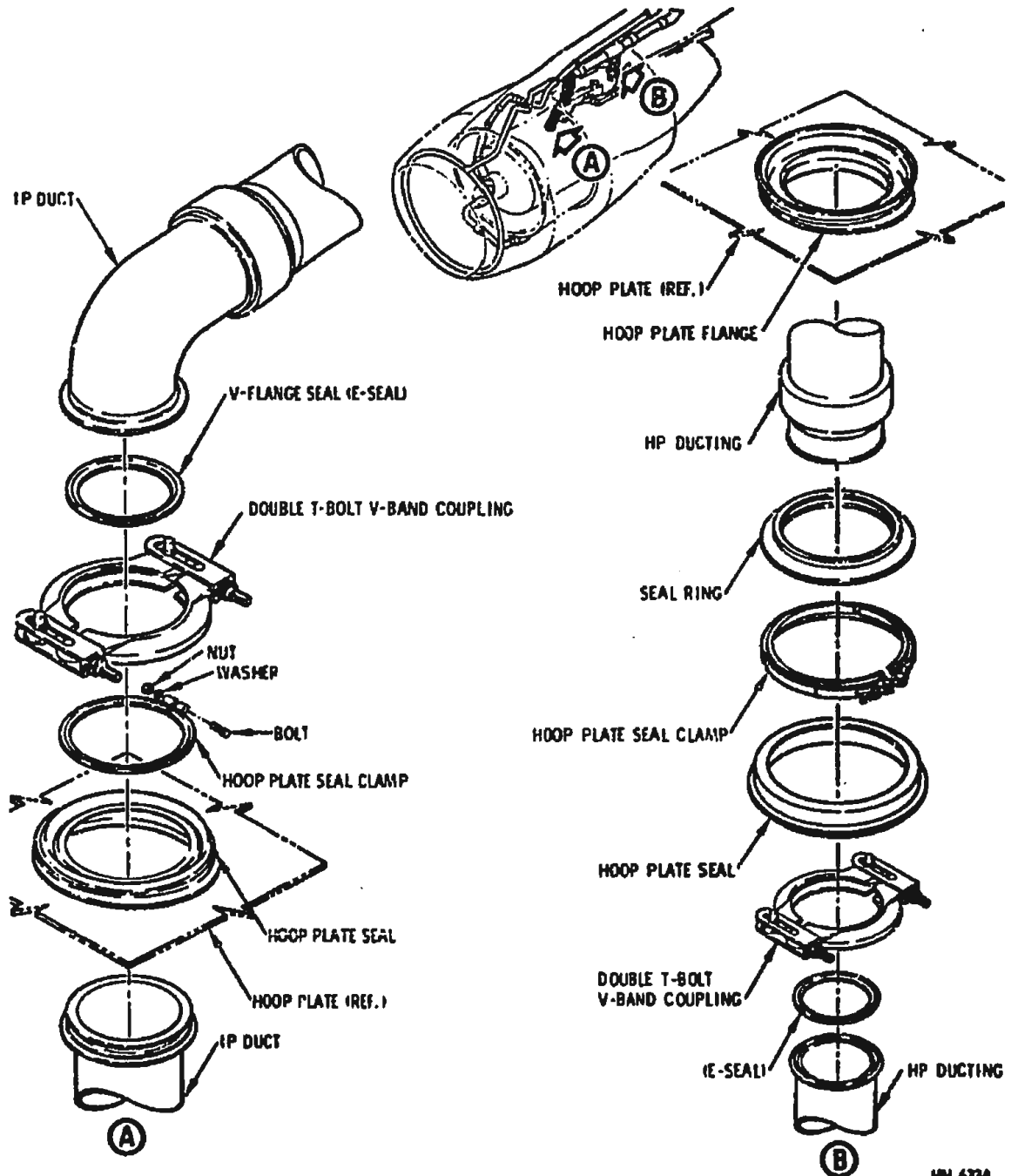
Starter Duct Section
Figure 405

EFFECTIVITY: ALL

001B

71-00-01
Page 412
May 15/77

LOCKHEED
MAINTENANCE MANUAL



HM 6334
M1-0102-71-428

R
R

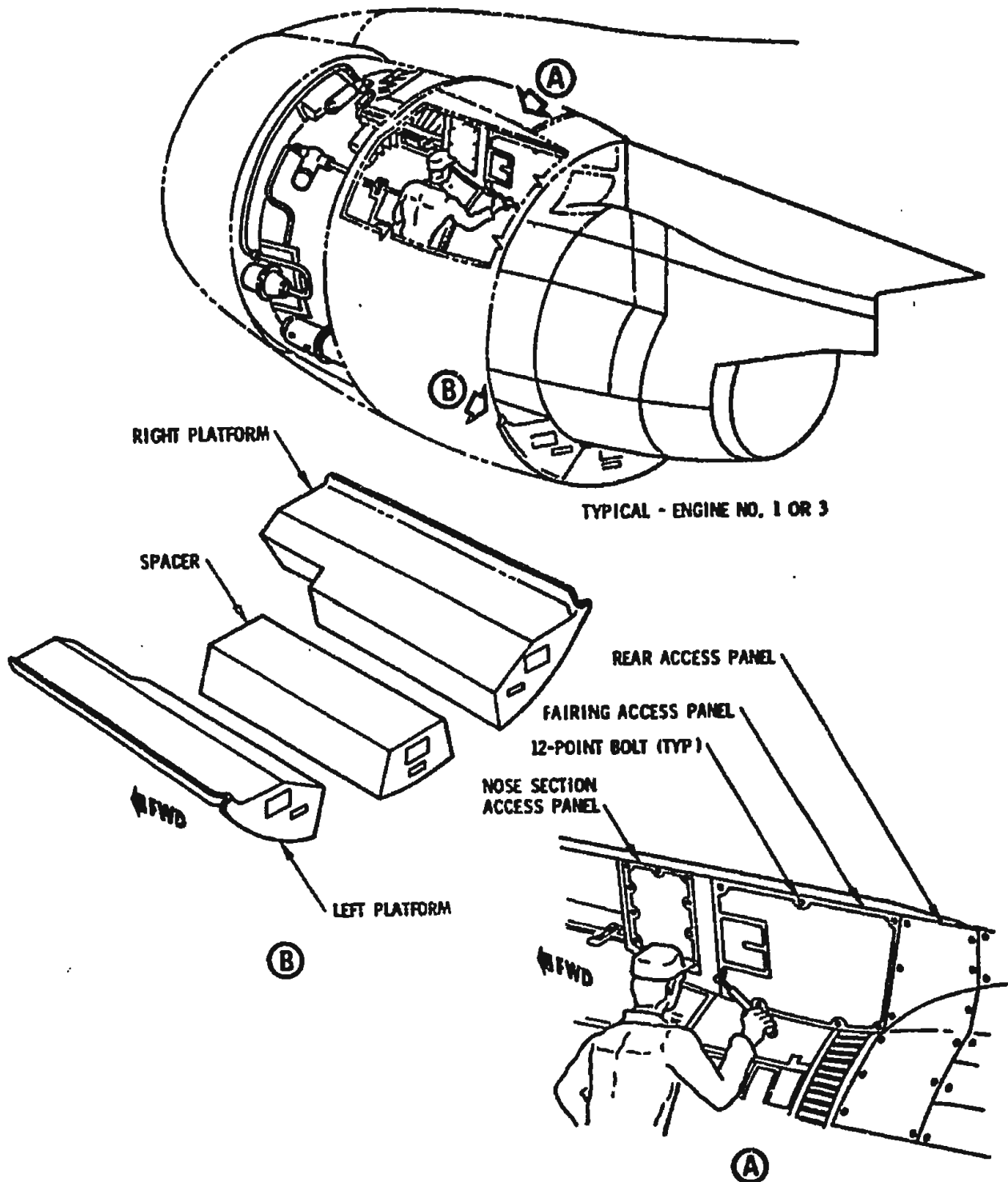
Wing QEC IP and HP Disconnects
Figure 406

EFFECTIVITY: ALL

001B

71-00-01
Page 413
May 15/77

LOCKHEED
MAINTENANCE MANUAL



ML-0238-71-004

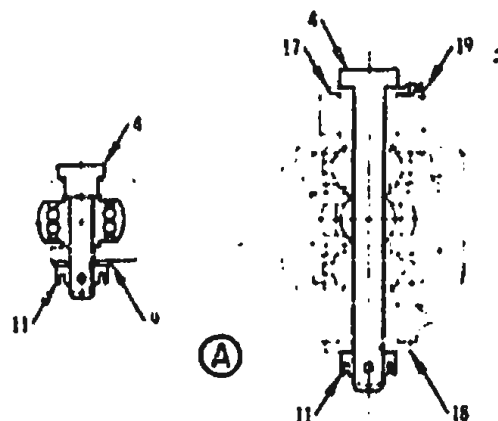
Wing QEC Splitter Area Access
Figure 407

71-00-01
Page 414
May 15/77

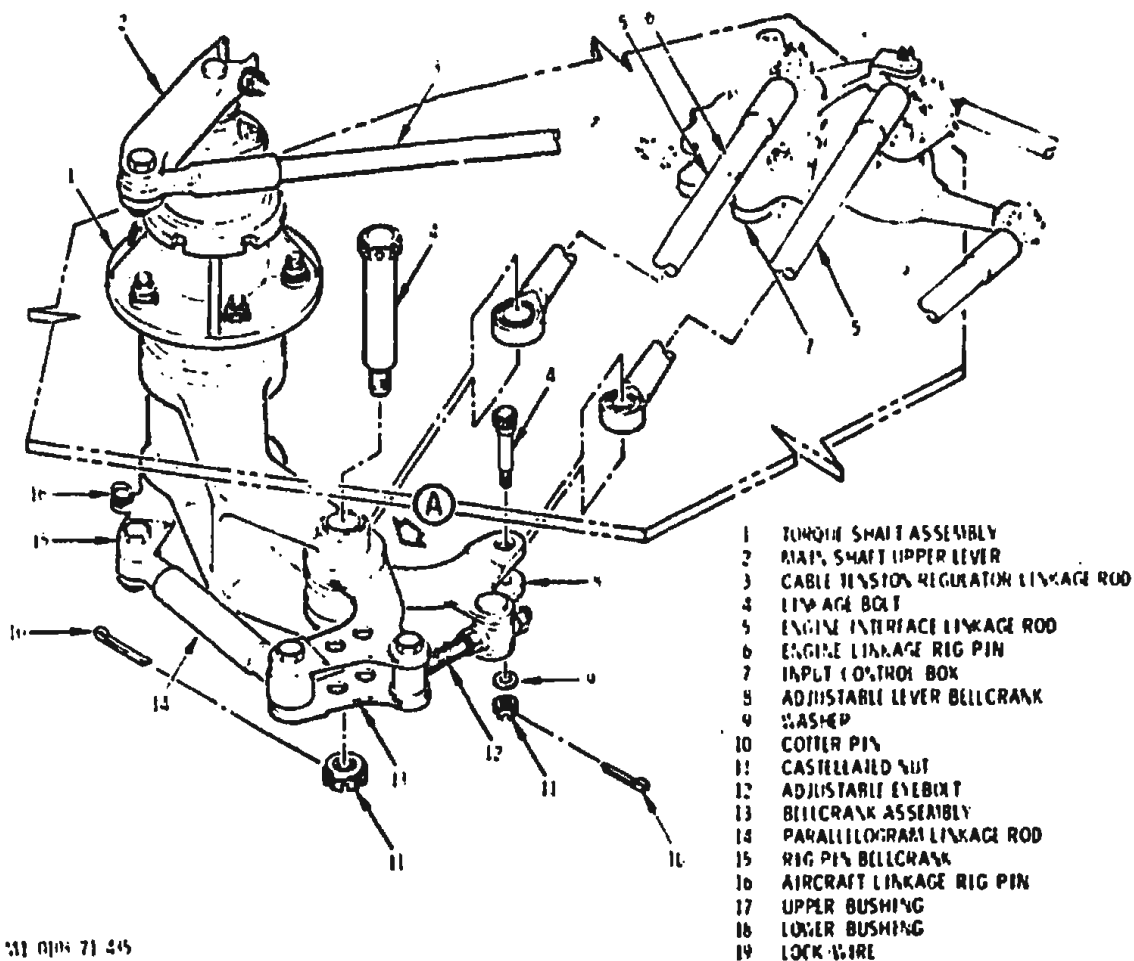
EFFECTIVITY: ALL

001B

LOCKHEED
MAINTENANCE MANUAL



ZONE 410, 420



311 0104 71 415

Wing QEC Throttle Linkage Disconnects
Figure 408

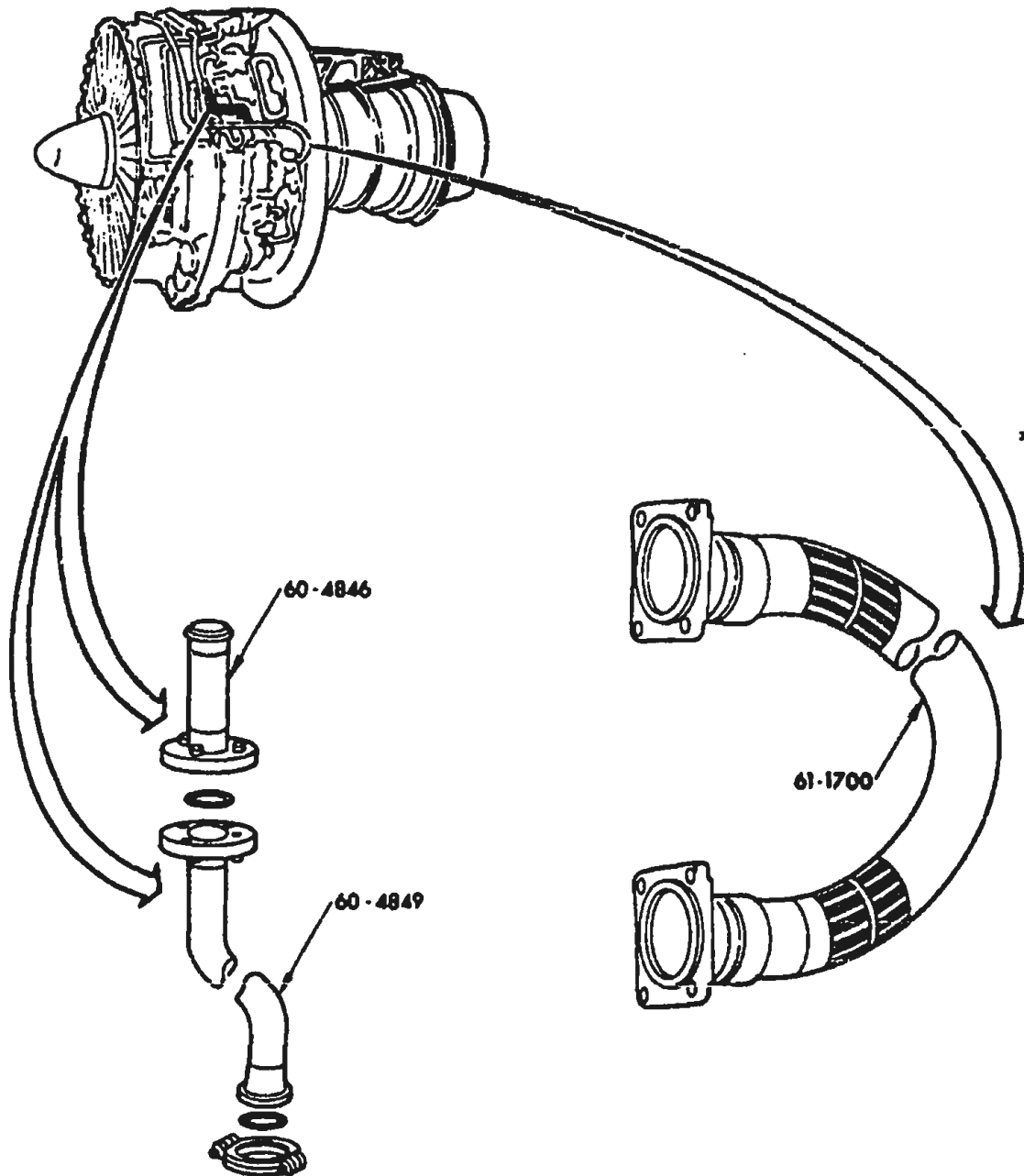
R
R

EFFECTIVITY: ALL

001B

71-00-01
Page 415
May 15/77

LOCKHEED
MAINTENANCE MANUAL



MI-0000-71-079

CR
CR

Engine Fuel Lines
Figure 408A

EFFECTIVITY: ALL

001B

71-00-01
Page 416
Nov 15/81

LOCKHEED
MAINTENANCE MANUAL

- (15) Disconnect starter duct at engine interface (Ref. Fig. 409), zone 414 or 424, by removing double T-bolt V-band coupling (Ref. 20-36-02) and the support bolt, and cap starter duct.
- (16) Disconnect anti-ice duct at engine interface by removing cover and double T-bolt V-band coupling (Ref. 20-36-02), and cap anti-ice ducts.
- (17) Disconnect, cap, and stow QEC electrical connectors (Ref. Fig. 410), zone 451 or 461.
- (18) Disconnect and cap fuel shutoff valve seal drain and pylon interface box drain hose (Ref. Fig. 411), zone 414 or 424.
- (19) Disconnect and cap IP reference pressure line (Ref. Fig. 412), zone 414 or 424, then secure loose end to aircraft structure to prevent damage during engine removal and installation.

CAUTION: USE EXTREME CARE TO PREVENT DAMAGING HYDRAULIC HOSES BY BENDING, KINKING OR TWISTING.

- (20) Disconnect hydraulic suction, pressure, and case drain pump lines lines (Ref. Fig. 413), zone 414 or 424. Cover disconnects with protective caps to prevent contamination.
- (21) Drain fuel from fuel supply line into a container by removing the drain plug (Ref. Fig. 414), zone 413 or 423. Reinstall drain plug and lock-wire.

- (21A) Remove fuel lines (Stk Nbr. 61-1700, 60-4846 and 60-4849) and stow in the box on the shipping skid.

NOTE: Assure both the lines removed and those left on the engine are properly capped (Ref. Figure 408A).

- (22) Disconnect and cap fuel lines.
- (23) Position engine transportation base and multipurpose stand (Ref. Fig. 415) below the engine.
- (24) Attach trunnion fittings to QEC unit, zones 414 or 424 and 413 or 423, as follows:
 - (a) Remove spherical bearings from engine stand forward supports, insert bearings into engine receptacle, and index for receiving trunnion bolts (Ref. Fig. 415).

R EFFECTIVITY: ALL

001B

71-00-01
Page 417
Jun 15/93

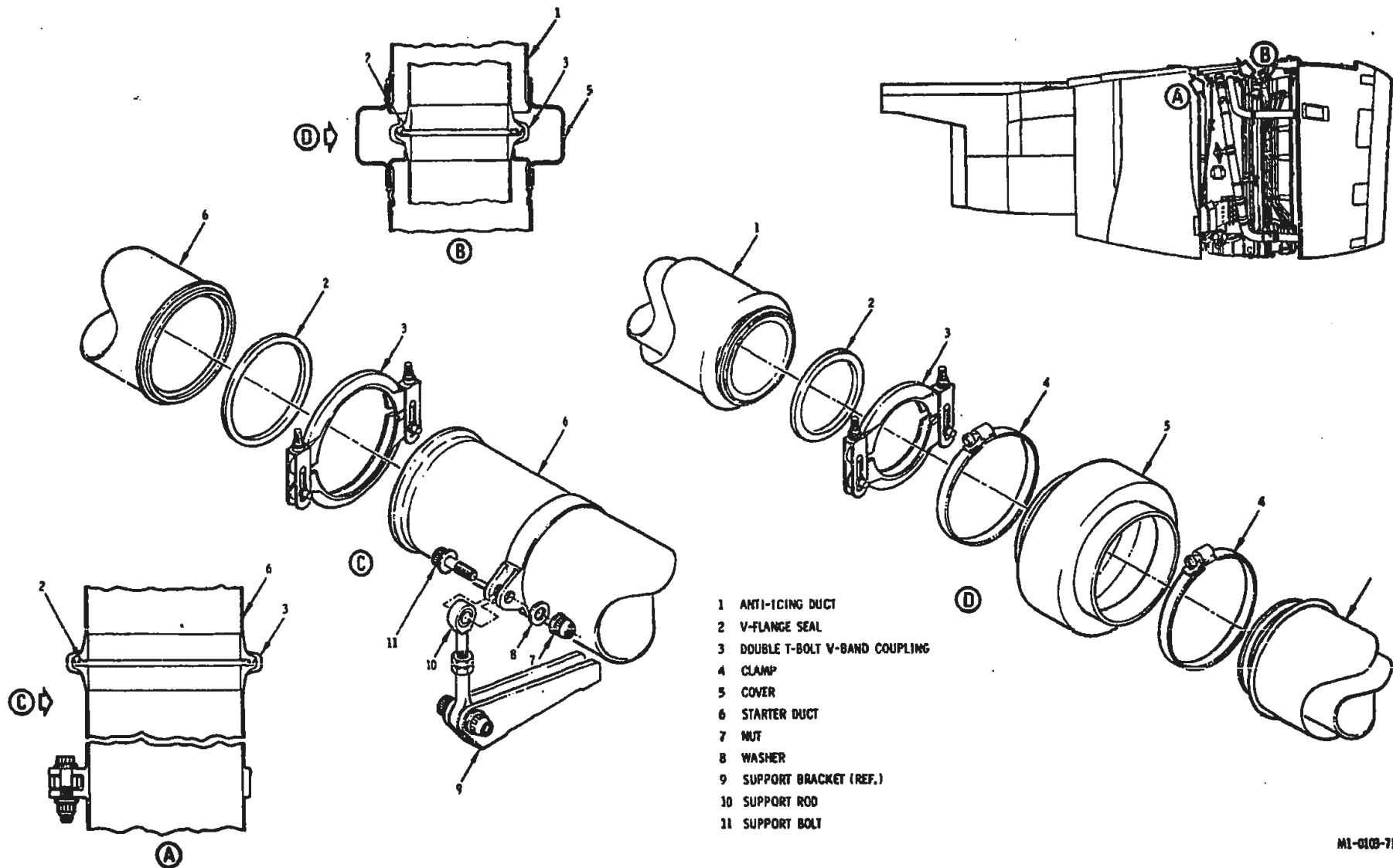


NOTE: Ensure that spherical bearing is free of burrs and nicks before inserting bearing into receptacle fitting.

- (b) Remove forward supports from engine stand and attach to spherical bearings in engine receptacle fittings.
 - (c) Remove aft supports from engine stand and attach to engine with pins that secure links to bosses of handling plates.
- (25) Install the wing QEC unit bootstrap equipment (Ref. Fig. 416) as follows:
- (a) Remove the ball-lock pin plugs, zone 452 or 462, from the wing pylon guide tube assembly and retain plugs for reinstallation.
 - (b) Place the wing engine bootstrap tie bar into the wing pylon guide tube assembly so that it extends out from the tube on both sides of the pylon.
 - (c) Ensure that the truss adapter pads are attached properly to the truss assemblies for the applicable installation.

NOTE: Each truss adapter pad has four attachment lugs to be used diagonally to provide the correct angle of attachment for the applicable installation.

- (d) Place the outboard truss assembly on the tie bar and secure them together with the retainer pin. Ensure that the adapter pad is positioned properly against the pylon.
- (e) Place the inboard truss assembly on the tie bar and secure them together with the retainer pin. Ensure that the adapter pad is positioned properly against the pylon.
- (f) Remove the hoist fitting plugs from the forward arch adapter pad attachment holes and install adapter pads.
- (g) Attach the forward arch to the adapter pads with directional arrow on the arch pointing inboard.
- (h) Assemble the bootstrap drag strut and attach it to the forward arch and the aft outboard truss.

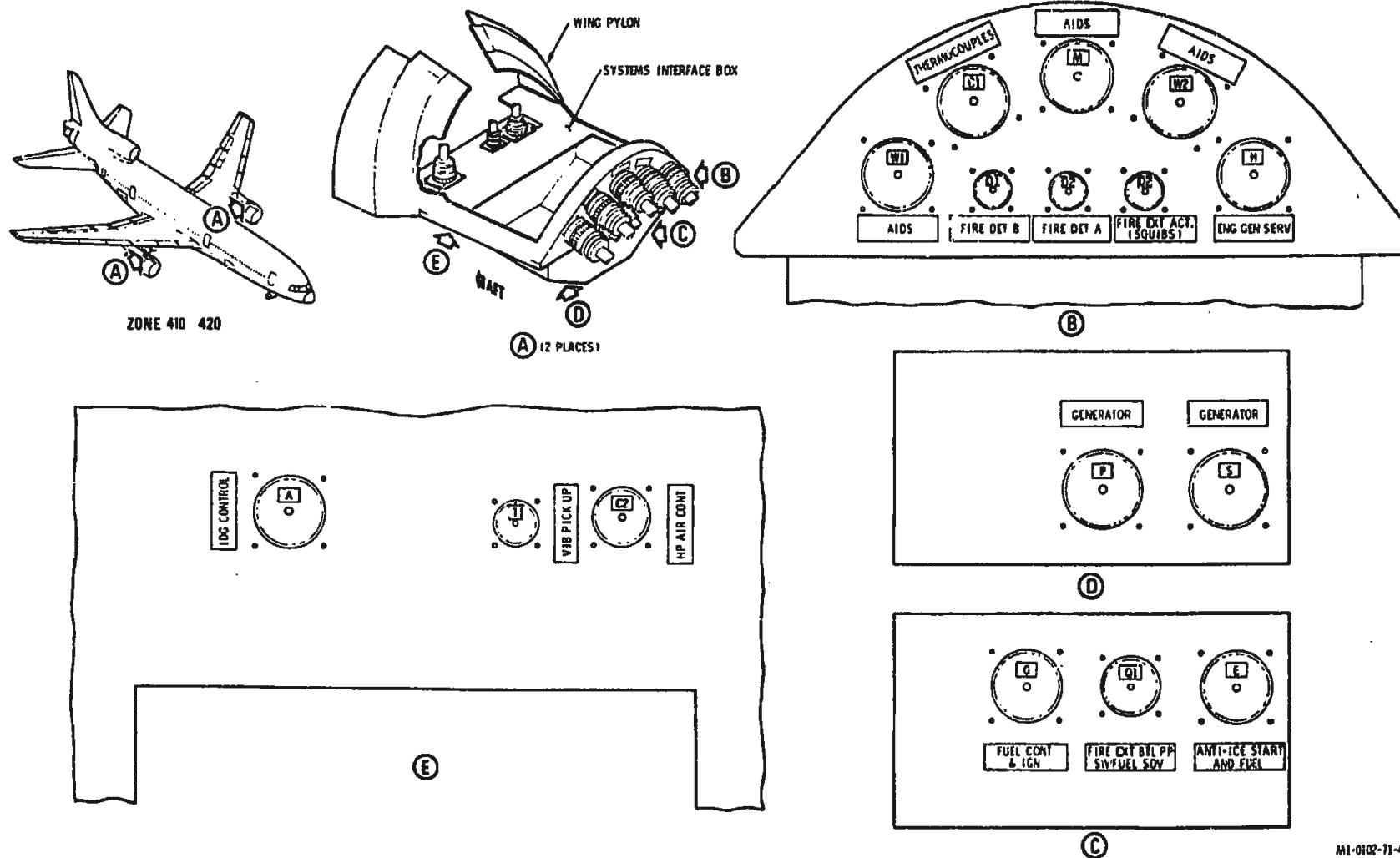


M1-0103-71-423

Wing QEC Anti-icing Duct and Starter Duct Disconnects
Figure 409

R EFFECTIVITY: ALL
R
001B

71-00-01
Page 419/420
Jun 15/93



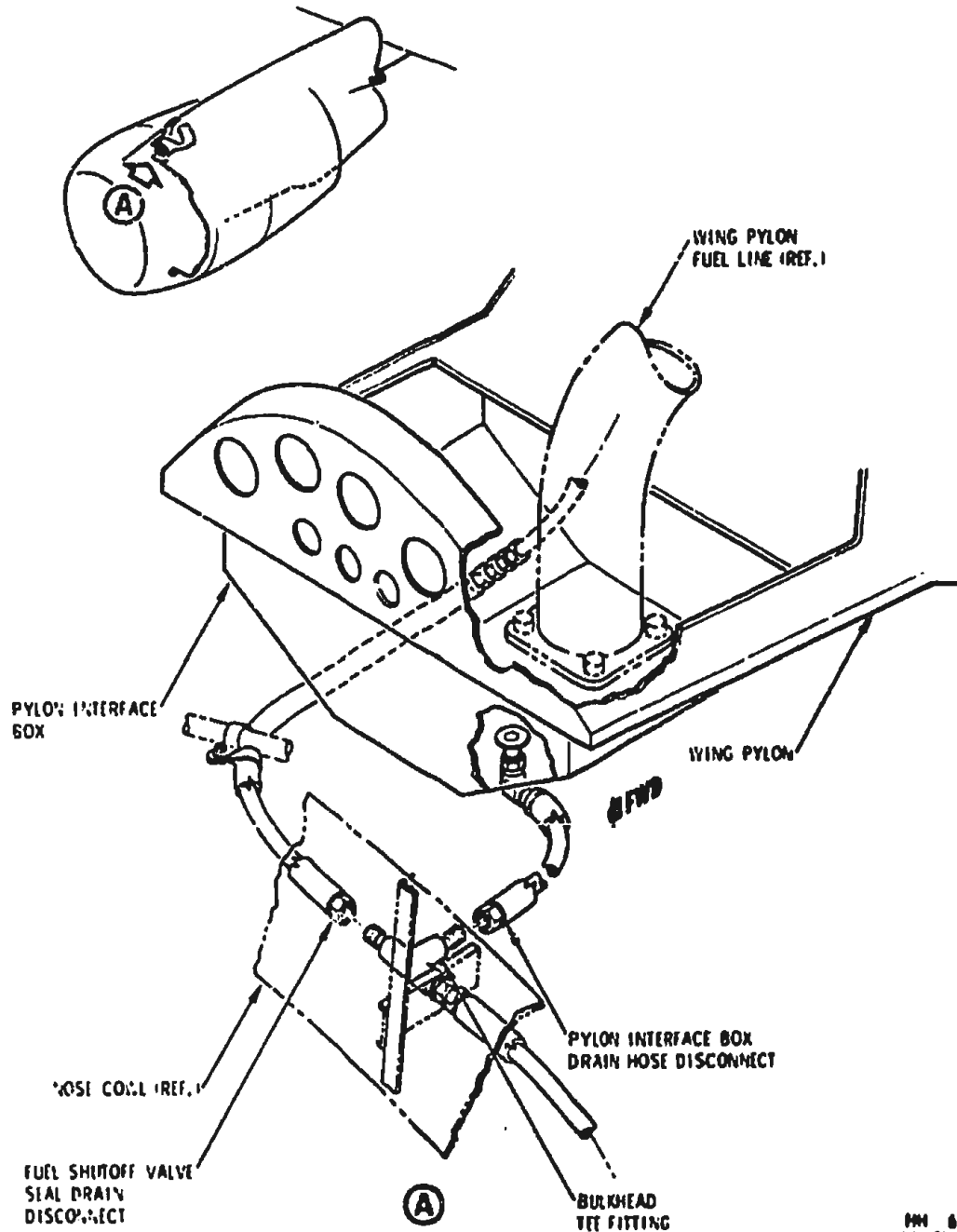
M1-0102-71-421

Wing QEC Electrical Disconnects
Figure 410

001B EFFECTIVITY: ALL

71-00-01
Page 421/422
Nov 15/81

LOCKHEED
MAINTENANCE MANUAL



PM 6180
111-420-71-436

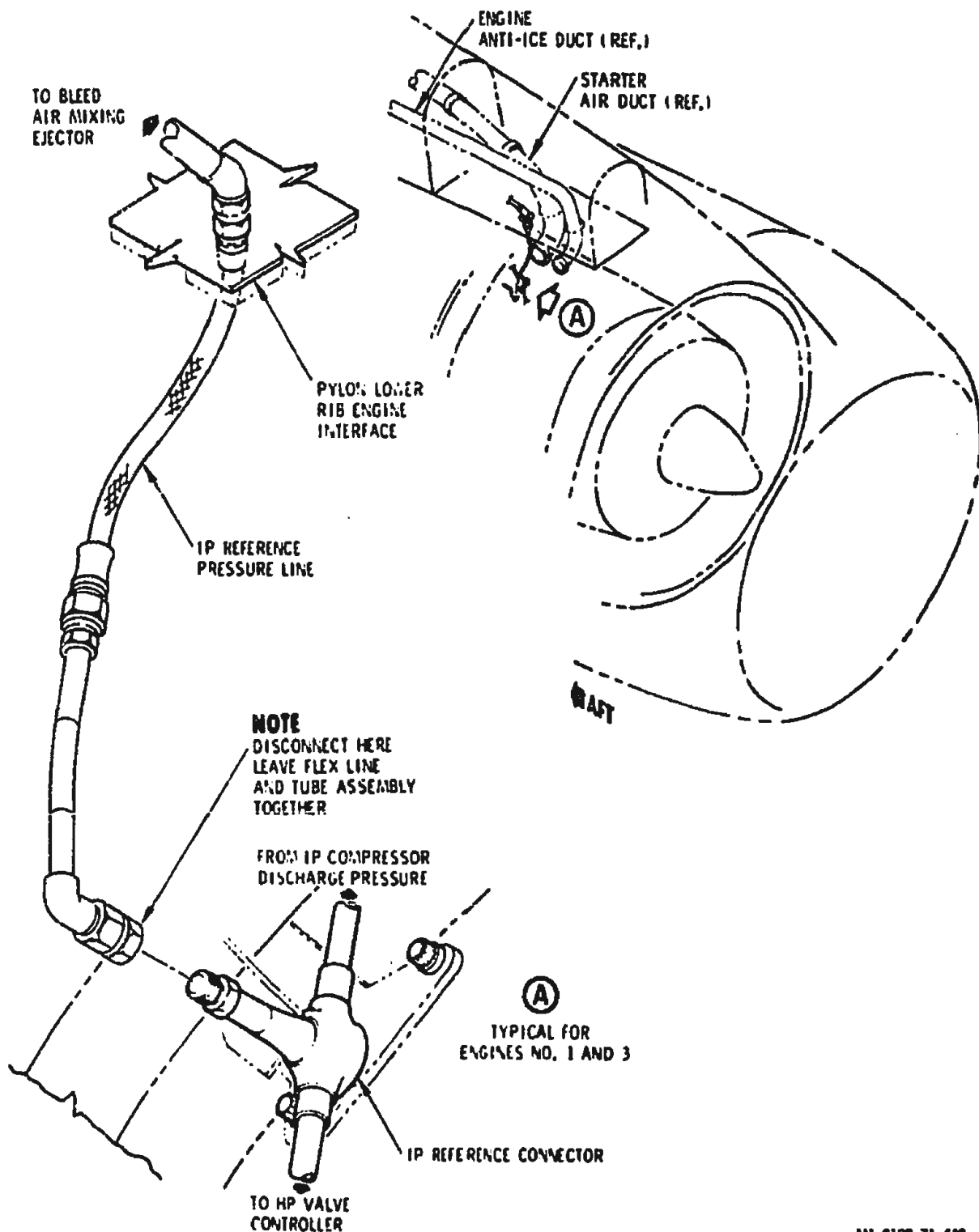
Firewall Area Drain Lines
Figure 411

R
R
001B

EFFECTIVITY: ALL

71-00-01
Page 423
Nov 15/81

LOCKHEED
MAINTENANCE MANUAL



MI-0102-71-440

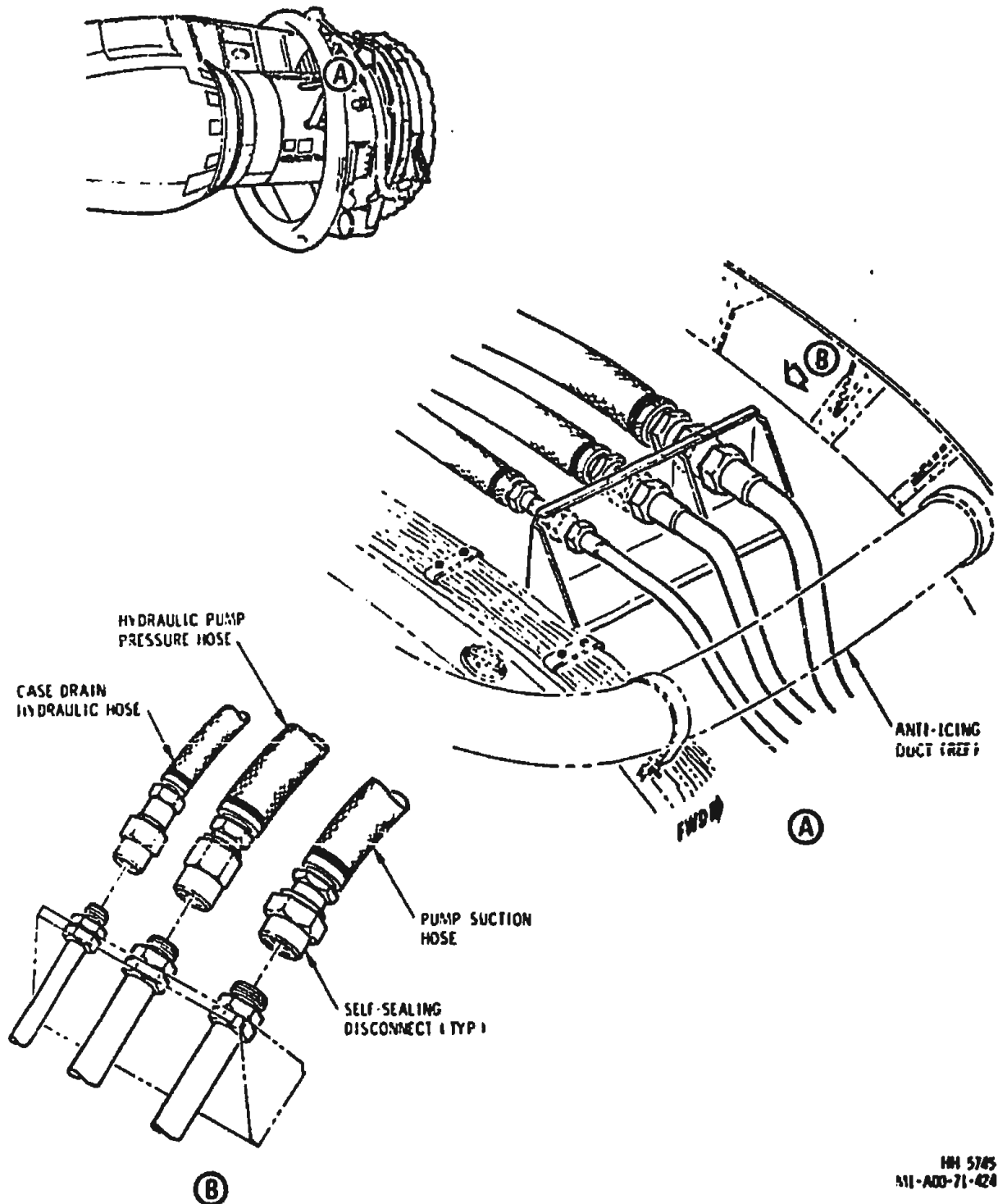
IP Reference Pressure Line
Figure 412

R
R
001B

EFFECTIVITY: ALL

71-00-01
Page 424
Nov 15/81

LOCKHEED
MAINTENANCE MANUAL



HM 5745
NII-A00-71-424

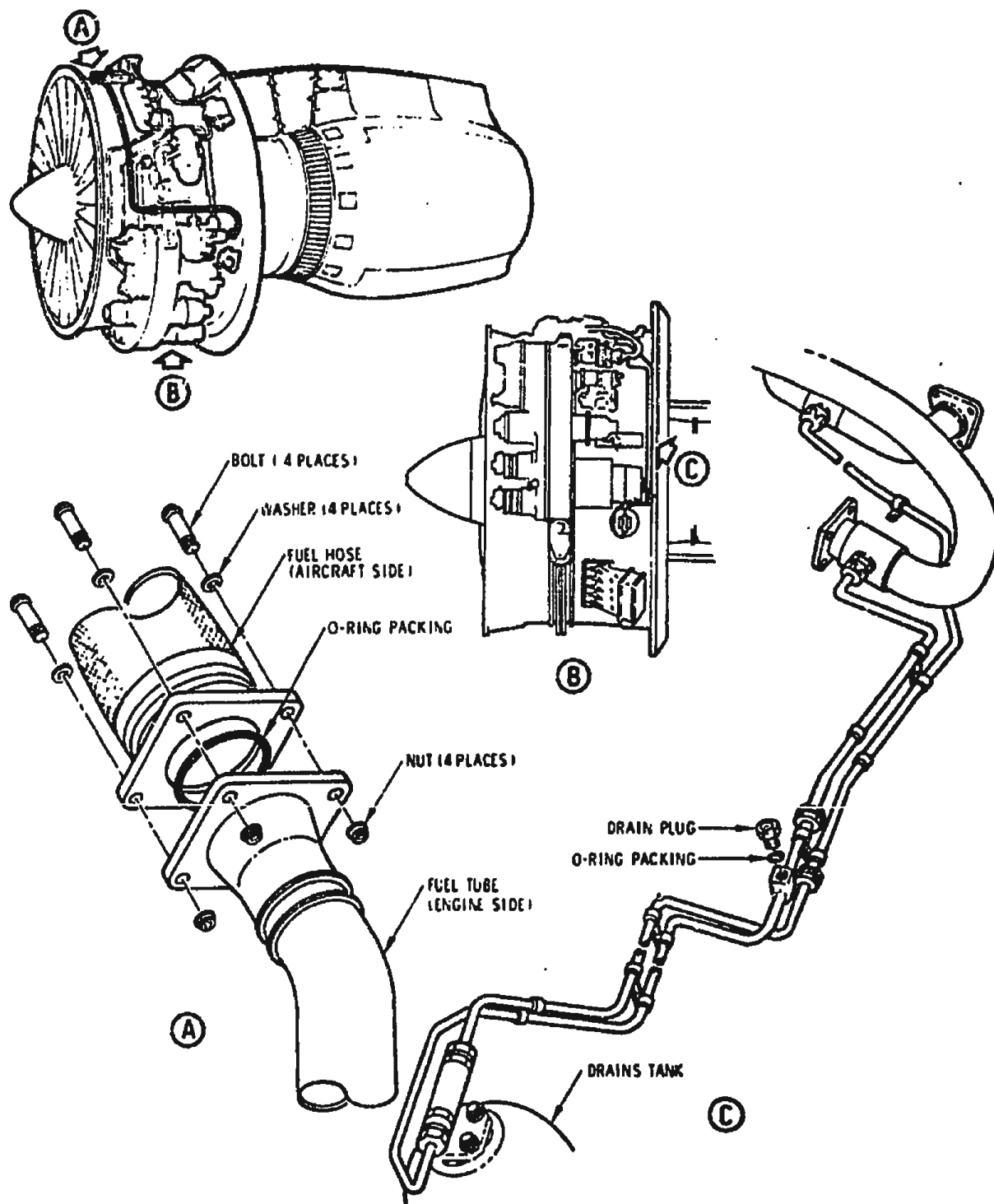
Wing QEC Unit Hydraulic Disconnects
Figure 413

R
R
001B

EFFECTIVITY: ALL

71-00-01
Page 425
Nov 15/81

LOCKHEED
MAINTENANCE MANUAL



M1-0101-71-426

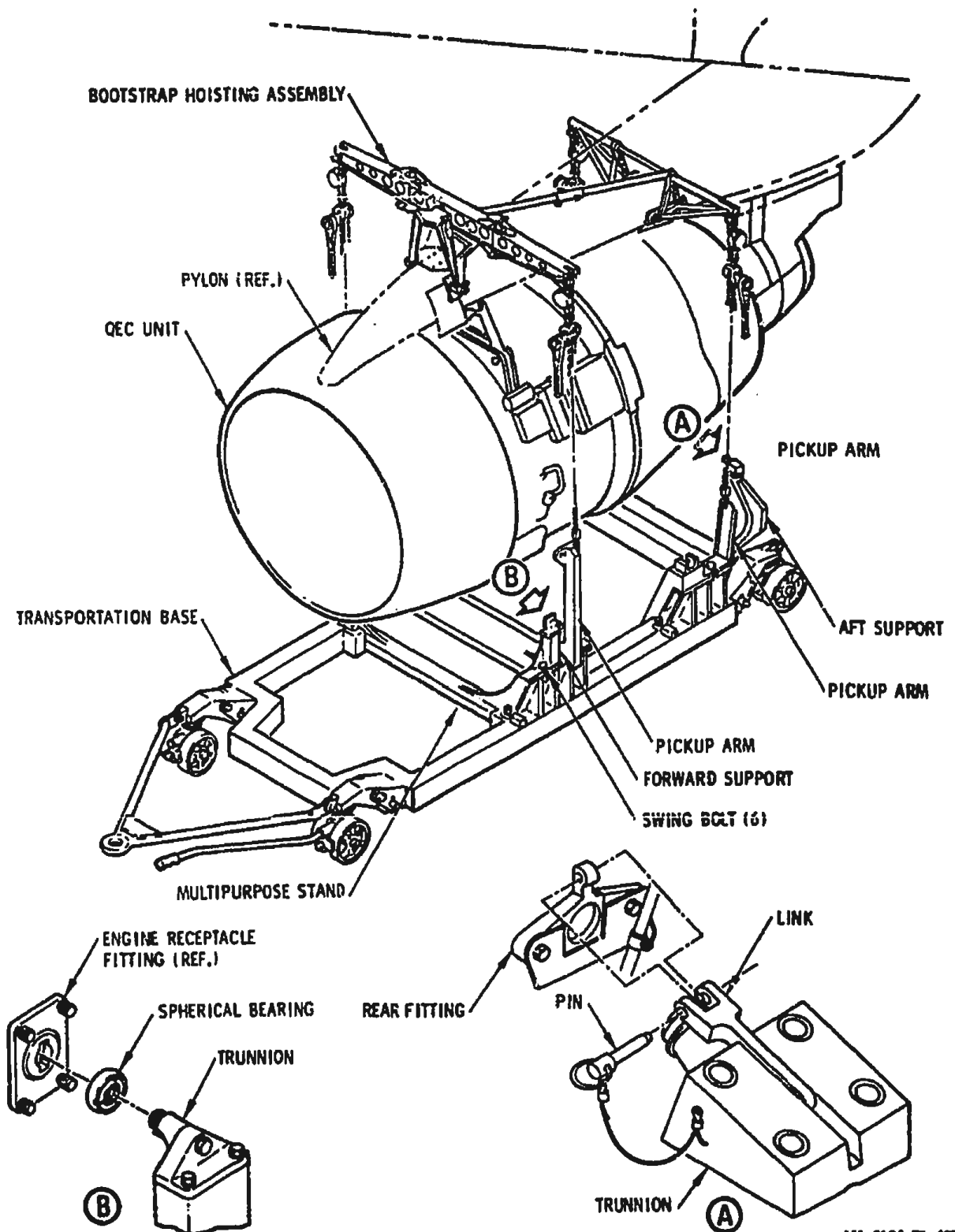
Wing QEC Unit Fuel Line Disconnect and Drain
Figure 414

R
R
001B

EFFECTIVITY: ALL

71-00-01
Page 426
Nov 15/81

LOCKHEED
MAINTENANCE MANUAL



M1-0104-71-425

Transportation Base and Multipurpose Stand
Figure 415

R
R
001B

EFFECTIVITY: ALL

71-00-01
Page 427
Nov 15/81

LOCKHEED
MAINTENANCE MANUAL

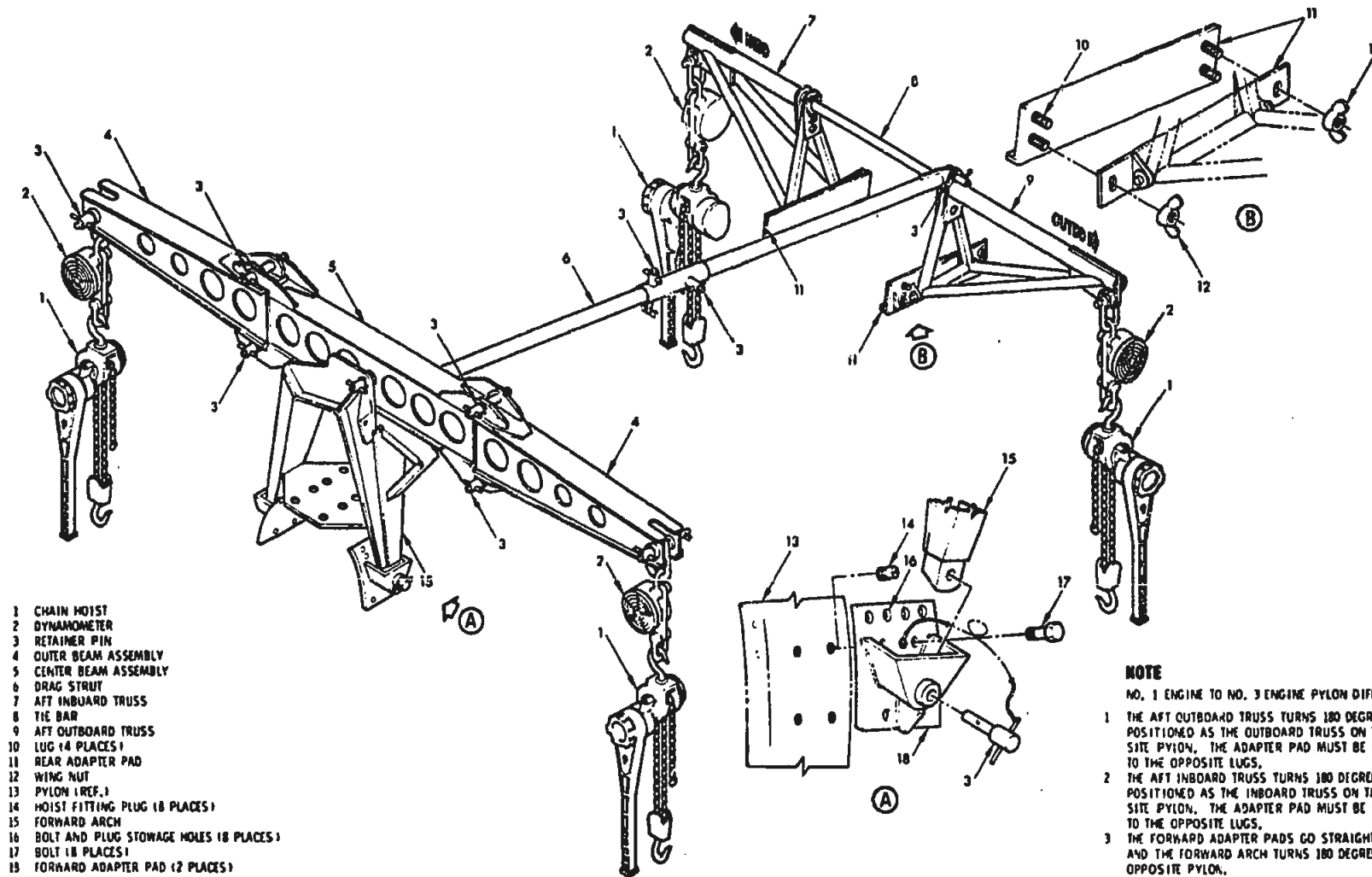
- (i) Attach the center beam assembly to the forward arch with the retainer pin.
 - (j) Attach the outer beam assemblies to the center beam assembly with retainer pins.
 - (k) Attach dynamometers and manual chain hoists to the outer beam assemblies.
 - (l) Attach dynamometers and manual chain hoists to the aft inboard truss and the aft outboard truss.
- (26) Extend hoist chains and attach to the applicable multipurpose stand pickup arms.
- (27) Detach (Ref. Fig. 415) multipurpose stand from the transportation base.

CAUTION: ENGINE TO STAND CLEARANCE IS EXTREMELY TIGHT. CLOSE ALIGNMENT MUST BE MAINTAINED DURING ALL OPERATIONS.

- (28) Actuate the manual chain hoists to remove slack from chains and hoist the multipurpose stand to approximate position for attachment to the QEC unit.
- (29) Attach supports and pickup arms to multipurpose stand.

CAUTION: DO NOT EXCEED LOAD OF 7000 LB ON A SINGLE FORWARD HOIST OR 4500 LB ON A SINGLE REAR HOIST. MAINTAIN EQUAL LOADS SIDE TO SIDE WITHIN ± 1000 LB BETWEEN THE FRONT DYNAMOMETERS AND BETWEEN THE REAR DYNAMOMETERS.

- (30) Preload dynamometers to ensure that hoists accept weight of engine and multipurpose stand as follows:
- (a) Determine weight of engine multipurpose stand.
 - (b) Add No. 1 or 3 engine weight of 13,090 lbs, weight of multipurpose stand, and 1000 lbs preload for a total load.
 - (c) Distribute the load approximately as follows:
 - 70 percent equally divided between two forward hoists
 - 30 percent equally divided between two rear hoists



- 1 CHAIN HOIST
- 2 DYNAMOMETER
- 3 RETAINER PIN
- 4 OUTER BEAM ASSEMBLY
- 5 CENTER BEAM ASSEMBLY
- 6 DRAG STRUT
- 7 AFT INBOARD TRUSS
- 8 TIE BAR
- 9 AFT OUTBOARD TRUSS
- 10 LUG (4 PLACES)
- 11 REAR ADAPTER PAD
- 12 WING NUT
- 13 PYLON (REF.)
- 14 HOIST FITTING PLUG (8 PLACES)
- 15 FORWARD ARCH
- 16 BOLT AND PLUG STORAGE HOLES (8 PLACES)
- 17 BOLT (8 PLACES)
- 18 FORWARD ADAPTER PAD (2 PLACES)

NOTE

- NO. 1 ENGINE TO NO. 3 ENGINE PYLON DIFFERENCES
- 1 THE AFT OUTBOARD TRUSS TURNS 180 DEGREES AND IS POSITIONED AS THE OUTBOARD TRUSS ON THE OPPOSITE PYLON. THE ADAPTER PAD MUST BE CHANGED TO THE OPPOSITE LUGS.
 - 2 THE AFT INBOARD TRUSS TURNS 180 DEGREES AND IS POSITIONED AS THE INBOARD TRUSS ON THE OPPOSITE PYLON. THE ADAPTER PAD MUST BE CHANGED TO THE OPPOSITE LUGS.
 - 3 THE FORWARD ADAPTER PADS GO STRAIGHT ACROSS AND THE FORWARD ARCH TURNS 180 DEGREES ON THE OPPOSITE PYLON.

11-0100-71-053

Engine No. 1 or 3 Bootstrap Hoisting Assembly
Figure 416

R EFFECTIVITY: ALL
R
0018

71-00-01
Page 429/430
Nov 15/81

LOCKHEED
MAINTENANCE MANUAL

WARNING: THE ENGINE MOUNT BOLTS MAY NOT BE LOOSENED BEFORE TAKING UP THE ENGINE WEIGHT WITH THE HOISTING EQUIPMENT.

- (31) Remove bolts (Ref. Fig. 417), zone 452 or 462, from QEC unit front and rear mounts. Tool GL-72-HA-1 (Ratcher Adapter) may be used to place a socket on the bolt head.

NOTE: If thread damage is evident on mount bolts, inspect nuts for thread wear or damage.

- (32) Lower QEC unit and multipurpose stand slowly, guiding them free of all interfaces with the pylon.

NOTE: On engines with RR SB78-3753, ensure that the left rear corner of the hinged cowl support structure clears the thrust reverser translating cowl proximity sensor harness.

- (33) Rotate QEC unit and multipurpose stand to vertical centerline position before mounting on transportation base.

NOTE: QEC unit installed position is in 5-1/2 degree roll outboard.

- (34) Secure multipurpose stand to transportation base (Ref. Fig. 415).

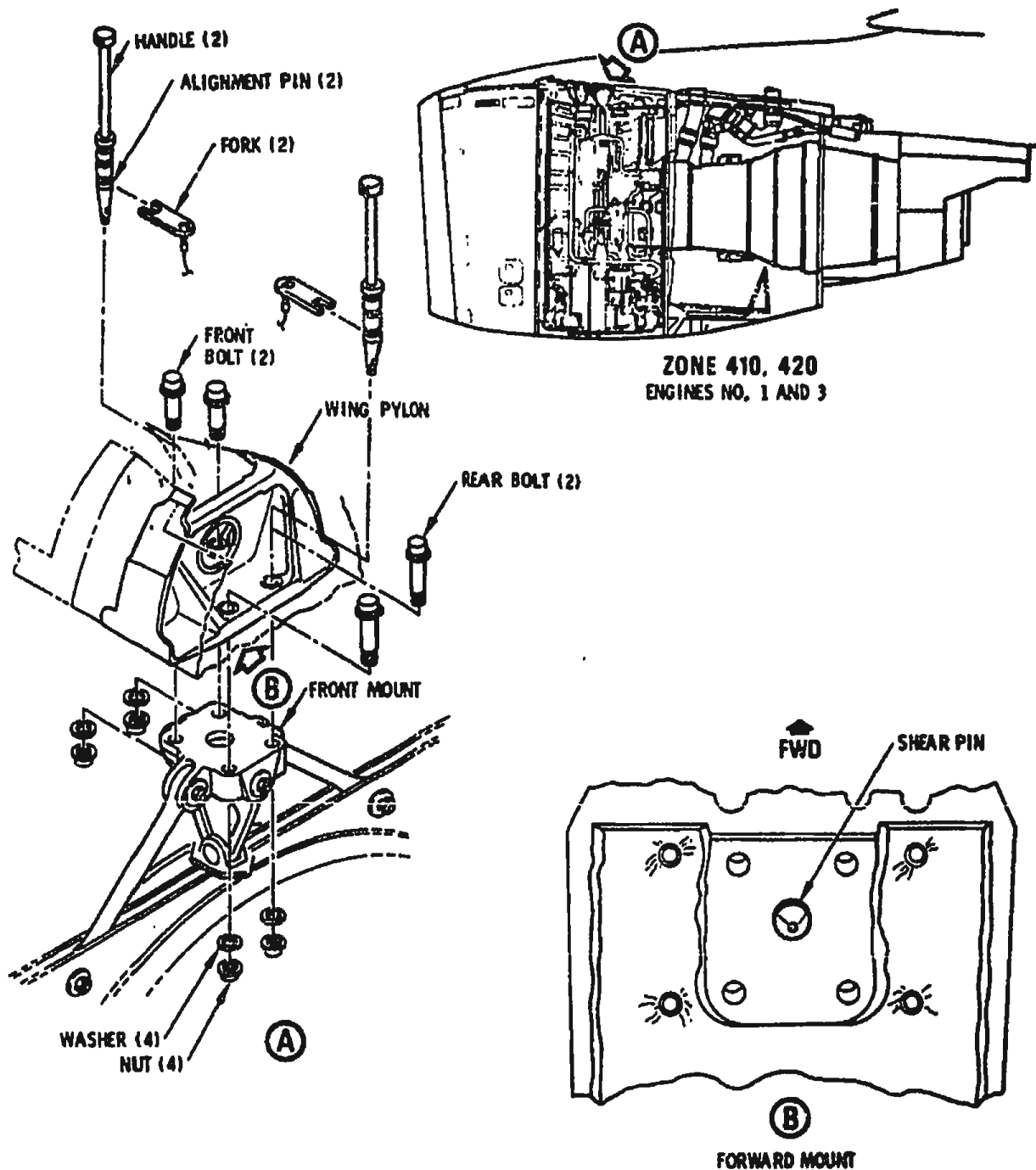
- (35) Inspect exposed surfaces of V-flange seals (E-seals) in all interface ducts for deformation, nicks, dents, cuts, or cracks. Remove and replace damaged seals.

NOTE: E-seals are manufactured slightly out-of-round for a secure fit in male portion of ducting joints. Most common defects will be nicks, dents, cuts, or deformation from a flat plane. Do not remove any seals if they appear to be in satisfactory condition.

- (36) Place duct covers over QEC unit and related aircraft exposed ducts.

- (37) Disconnect hoist cables from multipurpose stand and remove splitter access work platform from cold-stream collector.

- (38) Move transportation base to clear area for replacement of QEC unit.



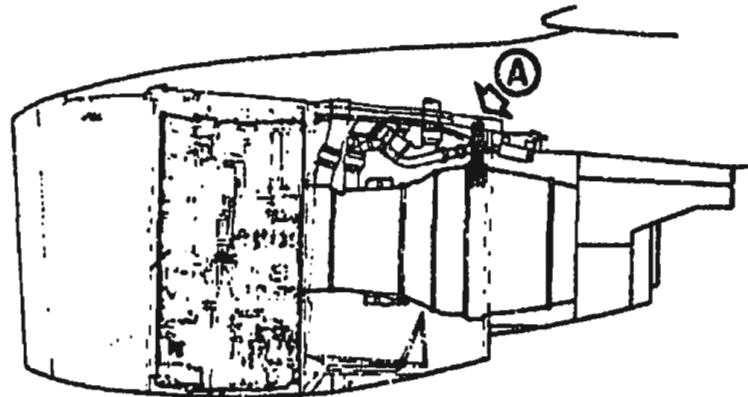
M1-0005-71-437

QEC Unit Mounts
Figure 417 (Sheet 1)

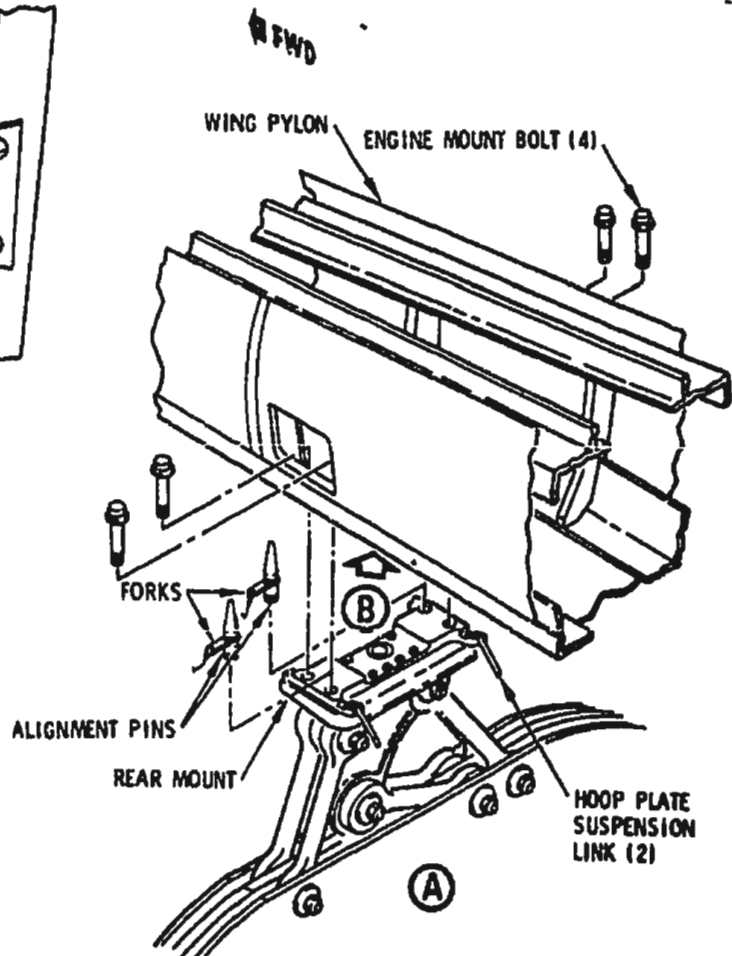
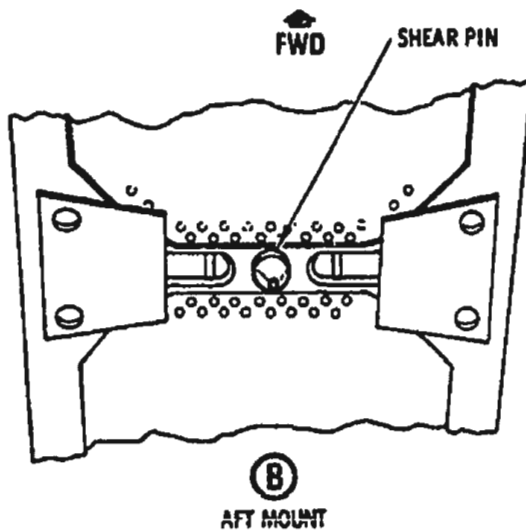
R
R
0018 EFFECTIVITY: ALL

71-00-01
Page 432
Nov 15/81

LOCKHEED
MAINTENANCE MANUAL



ZONE 410, 420
ENGINES NO. 1 AND 3



M1-0000-71-065

QEC Unit Mounts
Figure 417 (Sheet 2)

R
R
001B EFFECTIVITY: ALL

71-00-01
Page 433
Nov 15/81

**B. Installation (Bootstrap)**

- (1) Check that aircraft is in configuration established for removal, Step 3A(1).

NOTE: The thrust reverser airmotor oil reservoir can be filled and the level checked while the engine is installed on the multi-purpose stand by using the No. 2 engine position full mark on the airmotor oil dipstick. This oil level will then be correct when the engine is installed in any of the three positions on the aircraft.

CAUTION: ENGINE MOUNT NUTS, BOLTS, AND MOUNT BOLT HOLES MUST BE INSPECTED EACH INSTALLATION FOR SCORES, BURRS, AND ABRASIONS.

PRIOR TO AND DURING ENGINE INSTALLATION, CHECK THAT ENGINE FRONT AND REAR MOUNTS UPPER AND LOWER SURFACES, BOLT HOLES AND SHEAR PIN BLIND HOLES (THESE LOCATE WITH AIRFRAME MOUNTED SHEAR PINS) ARE FREE FROM DAMAGE, OIL, GREASE OR ANY OTHER FOREIGN MATERIAL. USING SOLVENT, WIPE CLEAN AS NECESSARY.

- (2) Inspect engine mount bolts and mount bolt holes each installation. Inspect nuts for cracks, thread wear or damage, and loose fit. Noticeable distortion or scratches deep enough to reduce efficiency of the threads is cause for rejection. The threads must remain in a serviceable condition and permit free installation with the fingers up to the self locking element. Reject bolts and nuts having stripped or cross threaded threads. If bolt/nut combinations, lubricated with MIL-T-5544, do not have a back-off breakaway torque of at least 70 pound-inches (back-off breakaway torque refers to minimum torque required after initial unseating), or if the free running torque while tightening is more than 800 pound-inches, reject the used nut. If same torque requirements cannot be met with a new nut, reject the bolt. Burrs, abrasions, or score marks must be fingernail smooth (Ref. Table 401 and Fig. 420) with the following limitations. [Bushings requiring rework beyond maximum limits must be replaced (Ref. 54-11-01)]:

- (a) Rework is not permitted on the bolt shank within 0.3 inch of the bolt head.

NOTE: Limit does not apply to Vibratory Rework Method.

R EFFECTIVITY: ALL

001B

71-00-01
Page 434
Jun 15/93

LOCKHEED



MAINTENANCE MANUAL

- (b) Rework must be held to a minimum, with a smooth transition from the normal diameter to the rework diameter.
- (c) The root radius of any score or scratch must be smoothed to 0.090 inch.
- (d) Machine-powered grinding is not permitted on bolts or bushings.
- (e) Rework bolthead flat surface to a maximum depth of .003 inches. Rework to be done by hand.
- (f) Shank wear or damage not exceeding a depth of 0.002 inch is negligible.
- (g) The bolt is considered unserviceable when the minimum pitch diameter is below 0.9415 inch.
- (h) The bolt is considered unserviceable when the major diameter is below 0.9868 inch.

C
C

C
C

C
C

R
R
001B

EFFECTIVITY: ALL

71-00-01
Page 435
Jun 15/93



MAINTENANCE MANUAL

Engine Mount Bolt And Mount Bolt Hole Rework
Table 401

PART NUMBER	DESCRIPTION	DIAMETER AFTER REWORK
VEP 220555-16	Bolt	.9880 min
FORWARD MOUNT:		
1549757-103	Bushing	1.050 max
1549757-105	Bushing	1.050 max
1549757-109	Bushing	1.050 max
1549757-111	Bushing	1.050 max
PREFERRED SPARES:		
1549757-115	Bushing	1.050 max
1549757-117	Bushing	1.050 max
AFT MOUNT:		
1549757-101	Bushing	1.050 max
1549757-107	Bushing	1.050 max
PREFERRED SPARES:		
1549757-113	Bushing	1.050 max

R EFFECTIVITY: ALL

001B

LOCKHEED



MAINTENANCE MANUAL

NOTE: If hand reworking is impractical, see Structural Repair Manual 54-00-00 for alternate method.

CAUTION: THE FORK MUST BE INSTALLED IN ALIGNMENT PIN GROOVE PRIOR TO SECURING PIN IN MOUNT TO CONTROL PIN PENETRATION AND PREVENT DAMAGE TO MOUNT BOLT NUTS.

- (3) Install alignment pins (Ref. Fig. 417 and Fig. 418) into aircraft side of engine front mount and thread alignment pins into engine side of engine rear mount (one pin in forward hole and one in diametrically opposite rear hole of each mount).

NOTE: The long shank of front mount alignment pin is the handle for inserting pin in engine mount.

- (4) Ensure that the IP, HP, starter, and anti-icing duct E-seals are serviceable and installed properly (Ref. Fig. 406 and 409).

- (5) Install aircraft linkage rig pin (Ref. Fig. 408).

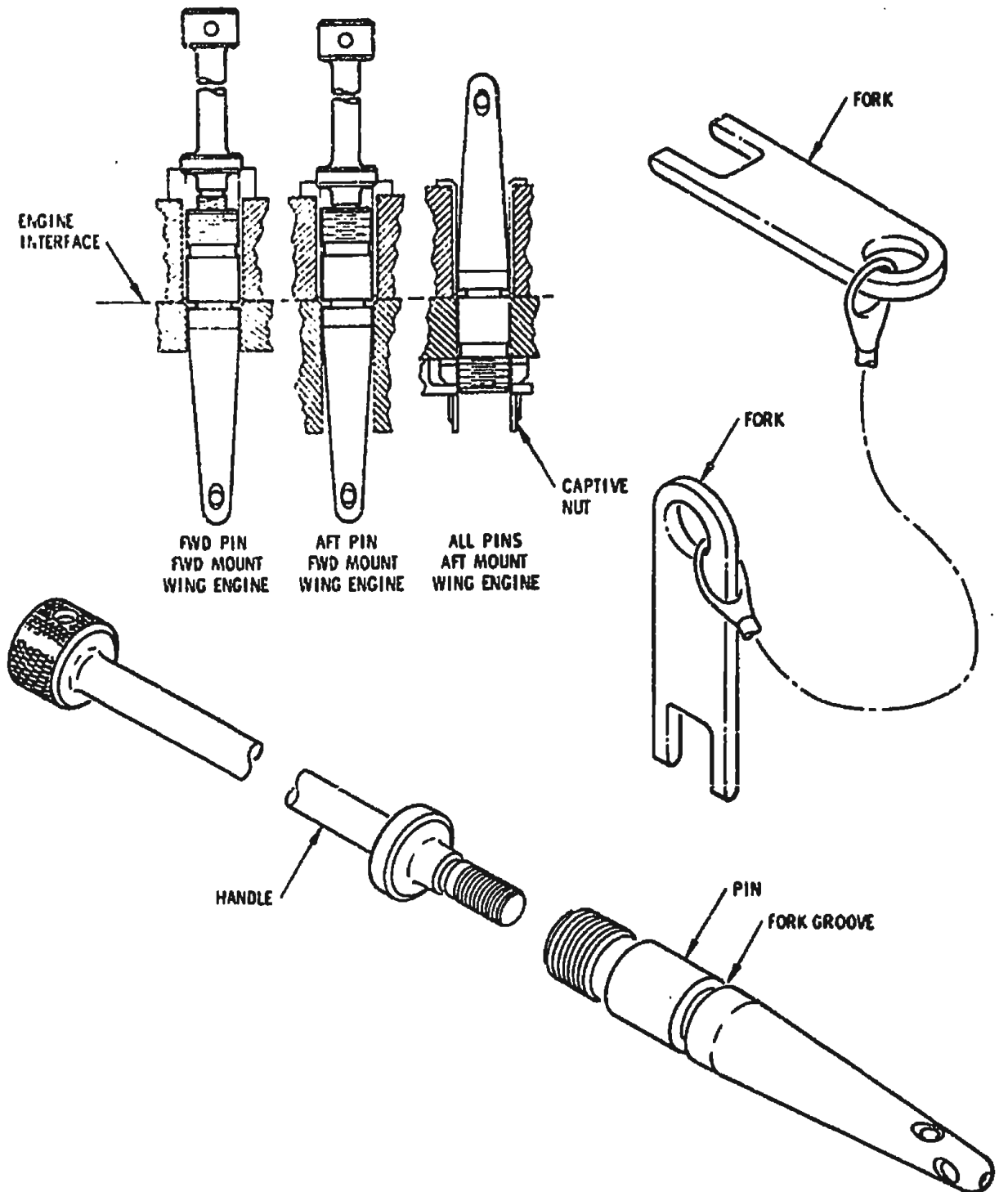
NOTE: With engine power control lever secured in fully retarded position, it may be necessary to pull reverse thrust control lever, zone 210, toward reverse position and to release it in the idle position to align rig pin holes.

- (6) Lubricate QEC unit mount bolts under bolt head, on shank, and on threads with MIL-T-5544, or equivalent lubricant.

CAUTION: WHEN INSTALLING A REVERSER, WHETHER BY ITSELF OR AS PART OF A REPLACEMENT ENGINE, ALWAYS CONFIRM THE CASCADE CONFIGURATION AGAINST MAINTENANCE MANUAL CHARTS AND MAKE CERTAIN IT IS CONFIGURED FOR THE ENGINE POSITION FOR WHICH IT IS TO BE INSTALLED (REF. 78-31-20).

- (7) Place the replacement QEC unit in position under the wing pylon in preparation for installation.
- (8) Ensure splitter area access work platform has been installed.
- (9) Extend the hoist chains (Ref. Fig. 416) and attach them to the applicable multipurpose stand pickup arms.
- (10) Detach multipurpose stand from transportation base.

LOCKHEED
MAINTENANCE MANUAL



M1-0102-71-438

Alignment Pins
Figure 418

R
R
0018 EFFECTIVITY: ALL

71-00-01
Page 438
May 15/82



MAINTENANCE MANUAL

- (11) Actuate manual hoists to remove slack from chains until each dynamometer indicates approximately 1000 pounds.
- (12) Remove protective covers and caps from ducts and openings.

CAUTION: THE WING PYLON FRONT AND REAR ENGINE MOUNT SHEAR PINS MUST BE SECURED IN THE PYLON ENGINE MOUNTS PRIOR TO ENGINE INSTALLATION.

- (13) Raise QEC unit until alignment can be visually determined (approximately 4 inches below mounts).
- (14) During all phases of mating the QEC unit to the wing pylon, monitor all interfaces for proper clearance. Apply roll outboard as necessary.
- (15) Raise rear section of QEC unit slowly, aligning hinged cowl support structure rear fittings and QEC rear mount. Stop hoist action when rear mounts are just far enough apart (approximately three-eighths inch) to allow removal of alignment pin forks.

R

R

R

R

R

R

NOTE: On engines with RR SB78-3753, ensure that the left rear corner of the hinged cowl support structure clears the thrust reverser translating cowl proximity sensor harness.

- (16) Mate the hinged cowl support structure rear fittings (Ref. Fig. 404) to the QEC unit pip pin receptacle and install pip pins.

CAUTION: DO NOT ALLOW ENGINE WEIGHT TO BE TAKEN UP BY BOLTS.

- (17) Install two bolts in rear mount bolt holes that do not contain alignment pins (Ref. Fig. 417), remove rear mount alignment pins and install remaining two bolts. Bolts should be finger tight.
- (18) Raise front section of QEC unit to approximately one-eighth inch of front mount, aligning hinged cowl support structure front fittings and QEC front mount.
- (19) Install hinged cowl support structure front pip pins (Ref. Fig. 404).

CAUTION: DO NOT ALLOW ENGINE WEIGHT TO BE TAKEN UP BY BOLTS.

EFFECTIVITY: ALL

001B

71-00-01
Page 439
Mar 15/83

LOCKHEED



MAINTENANCE MANUAL

- (20) Install two bolts, washers and nuts in front mount bolt holes that do not contain alignment pins (Ref. Fig. 417), remove front mount alignment pins and install remaining two bolts. Bolts should be finger tight.

NOTE: Washer countersink position is immaterial in engine No. 1 or No. 3 installation as mount bolt head contacts bushing.

CAUTION: DO NOT EXCEED 7000 LB LOAD ON A SINGLE FORWARD HOIST OR 4500 LB ON A SINGLE REAR HOIST. MAINTAIN EQUAL SIDE-TO-SIDE LOADS WITHIN 1000 LB BETWEEN THE FRONT DYNAMOMETERS AND BETWEEN THE REAR DYNAMOMETERS. DO NOT EXCEED VERTICAL TRAVEL LIMIT UNDER LOAD OF 7 DEGREES 30 MINUTES. OBSERVE LIMIT MARKINGS ON BOOTSTRAP CENTER BEAM AND FORWARD ARCH.

- (21) Raise QEC unit to engage front and rear mounts. Apply an upward load (preload in addition to the engine and stand weight) of approximately 500 lbs on each mount pad (250 lbs per dynamometer).

NOTE: Verify that bolt threads and nut self-locking feature have been checked as required in Step 3B(2).

- (22) Torque all mount bolts to 700 (± 50) lb ft. The bolts at each mount pad are to be torqued first across the diagonals, then in sequence around the bolt pattern so that each bolt is torqued twice.

NOTE: If access to the bolts is difficult, tool No. GL-72-HA-1 (Ratchet Adapter) may be used as per Fig. 419, paying close attention to the torque application chart.

In the event engine mount bolts are incorrectly torqued, assuming they have not been torqued to more than 950 lb ft, retorquing can be accomplished as follows:

- (a) Loosen each bolt, following the torque pattern, and retorque before loosening next bolt.
- (b) Removal of any bolt for inspection can be accomplished during the sequence.

- (23) Decrease load until dynamometers indicate approximately weight of multipurpose stand and detach trunnion bolts, trunnions, spherical bearings, and supports (Ref. Fig. 415) from QEC unit, zone 413 or 423.

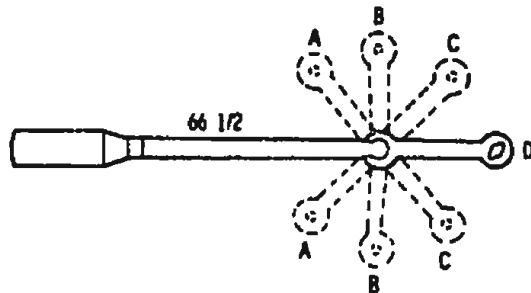
EFFECTIVITY: ALL

001B

71-00-01
Page 440
Mar 15/83

LOCKHEED
MAINTENANCE MANUAL

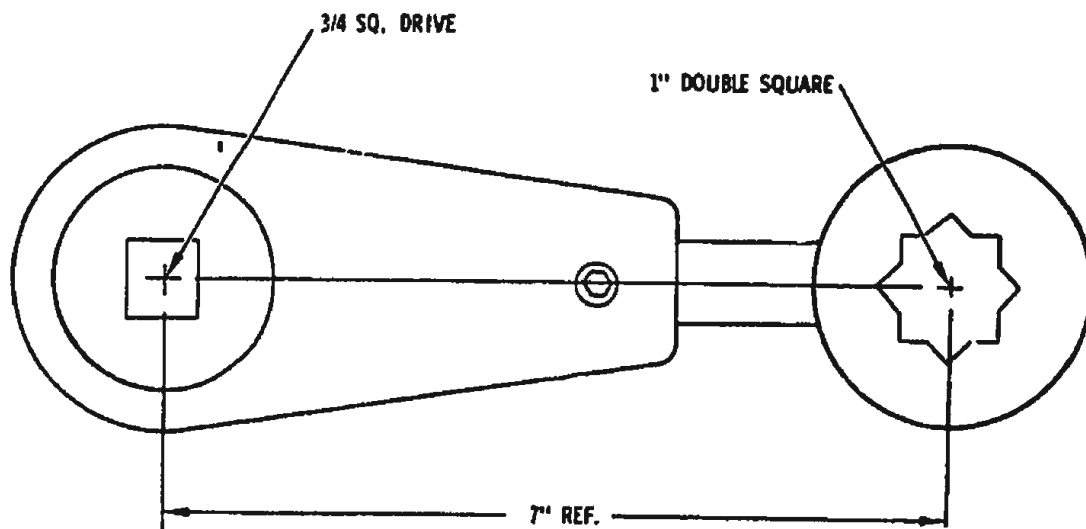
TORQUE WRENCH EXTENSIONS USE



TORQUE APPLICATION CHART
USING EXTENSION INDICATED.

POSITION	INDICATED TORQUE
A	744.5 (± 52.5)
B	700 (± 50)
C	665 (± 47.5)
D	616 (± 44)

NOTE: THIS CHART IS FOR USE
WITH RATCHET ADAPTER, TOOL
#GL-72-MA-1 AND A 66 1/2
TORQUE WRENCH.



M1-0000-71-001

Torque Application Chart for Ratchet Adapter
Figure 419

0018 EFFECTIVITY: ALL

71-00-01
Page 441
May 15/82

LOCKHEED
MAINTENANCE MANUAL

- (24) Lower multipurpose stand and secure to transportation base.
- (25) Detach hoist chains from multipurpose stand.
- (26) Remove transportation base from area.
- (27) Run hoist chains to fully up position.
- (28) Remove wing QEC unit bootstrap assembly (Ref. Fig. 416) as follows:
 - (a) Remove dynamometers and manual chain hoists from aft inboard and aft outboard truss assemblies.
 - (b) Remove dynamometers and manual chain hoists, from outer beam assemblies.
 - (c) Detach outer beam assemblies from center beam.
 - (d) Detach center beam assembly from forward arch.
 - (e) Detach drag strut from forward arch and aft outboard truss.
 - (f) Detach and remove forward arch from adapter pads.
 - (g) Remove forward arch adapter pads and install hoist fitting plugs.
 - (h) Remove aft inboard and outboard truss assemblies.
 - (i) Remove tie bar from pylon guide tube.
 - (j) Install ball-lock plugs in pylon guide tube.
- (29) Connect HP duct hoop plate seal and coupling (Ref. Fig. 406), zone 415 or 425. Secure with hoop plate seal clamp and HP duct double T-bolt V-band coupling (Ref. 20-36-02). Reconnect Support Cable Linkage from the (HP) duct to the (TR) duct.

NOTE: It may be necessary to use a wood or micarta block approximately 30 inches long, 3-3/4 inches high, and 1-3/4 inches wide to assist in connecting HP duct.
- (30) Connect IP duct seal and IP duct (Ref. Fig. 406), zone 415 or 425, and secure duct with double T-bolt V-band coupling (Ref. 20-36-02).

LOCKHEED
MAINTENANCE MANUAL

- (31) Install the starter duct section (Ref. Fig. 405), zone 452, or 462, and secure with double T-bolt V-band couplings (Ref. 20-36-02).
- (32) Connect starter duct (Ref. Fig. 409), zone 414 or 424, and secure with double T-bolt V-band coupling (Ref. 20-36-02).
- (33) Connect starter duct support rod if it has been detached.
- (34) Connect anti-icing duct (Ref. Fig. 409), zone 414 or 424, and secure with double T-bolt V-band coupling (Ref. 20-36-02).
- (35) Connect engine (throttle) interface linkage rods (Ref. Fig. 408), zone 413 or 423.
- (36) Remove and stow rig pins.
- (37) Connect fuel shutoff valve seal drain and pylon interface box drain hose (Ref. Fig. 411), zone 414 or 424.
- (38) Remove cap and securing device then connect IP reference pressure line (Ref. Fig. 412), zone 414 or 424, to IP reference connector.

NOTE: On engines with RR SB72-2149, verify that unused P1 connection is blanked and lockwired.

- (39) Ensure that hoop plate suspension links are connected (Ref. Fig. 417).

CAUTION: USE EXTREME CARE TO PREVENT DAMAGING HYDRAULIC HOSES BY BENDING, KINKING OR TWISTING. PREVENT INTRODUCTION OF TWISTING PRELOAD IN HOSES WHEN TIGHTENING FITTINGS.

- (40) Remove caps and connect hydraulic case drain self-sealing disconnect (Ref. Fig. 413), zone 414 or 424.
- (41) Remove caps and connect hydraulic pressure self-sealing disconnect.
- (42) Remove caps and connect hydraulic suction self-sealing disconnect.
- (43) Remove caps and connect fuel line (Ref. Fig. 414), zone 413 or 423.

R
R
001B EFFECTIVITY: ALL

71-00-01
Page 443
May 15/90

LOCKHEED
MAINTENANCE MANUAL

CAUTION: HAND TIGHTEN ELECTRICAL CONNECTOR PLUG SHELLS ONLY UNTIL THE FULLY COUPLED INDICATOR LINE IS COVERED AND THE THREADS HAVE BOTTOMED OUT TO ENSURE SELF LOCKING FEATURE HAS ENGAGED.

- (44) Remove caps from electrical plugs and receptacles (Ref. Fig. 410), zone 451 or 461, and connect plugs.

NOTE: Ensure that harnesses P, S, C2, T, E, Q1, and G are secured to the first and second clip/clampblocks securing harnesses to engine.

- (45) Verify that electrical power is provided to the aircraft (Ref. 24-41-00).
- (46) Remove tags and close circuit breakers opened in Step 3A(1)(f).
- (47) Push in engine fire emergency shutoff control handle, zone 210, to open the firewall fuel and hydraulic shutoff valves (Ref. 28-24-07 and 29-11-32).
- (48) Pressure-check fuel system (Ref. 28-24-00) for leaks at fuel disconnect and drain plug.

NOTE: If the engine is installed with inhibiting oil in the fuel system, the inhibiting oil can be removed by wet motoring then dry motoring the engine before attempting an engine start (Ref. 71-00-00).

- (49) Pressure-check bleed air system (Ref. 71-00-01) for leaks at IP, HP, anti-ice, and start duct interface disconnects.
- (50) On engines without RR SB75-3594, perform air inlet shutoff valve operational test (Ref. 75-21-04).
- (51) Service engine oil system (Ref. 12-12-01).
- (52) Service engine starter (Ref. 12-12-11).
- (53) Service thrust reverser motor (Ref. 12-12-71).
- (54) Service integrated drive generator oil system (Ref. 12-12-21).
- (55) Perform integrated drive generator Disconnect Test (Ref. 24-11-01).

R EFFECTIVITY: ALL

001B

71-00-01
Page 444
May 15/87



MAINTENANCE MANUAL

- (56) Perform pump priming and air bleeding operations (Ref. 29-11-07) then remove placards from hydraulic system panels.
- (57) Perform hydraulic system firewall shutoff valve Operational Test and hydraulic pump despressurization solenoid check (Ref. 29-11-32).
- (58) Perform fuel system firewall shutoff valve operational test (Ref. 28-24-07).
- (59) Perform fire extinguisher container inspection (Ref. 26-21-01).
- (60) Install the following fairings and panels (Ref. Fig. 403), zone 410 or 430 (Ref. 6-40-00 and 6-50-00):
 - (a) Thrust reverser interface fairings, 435AL and 435AR
 - (b) Engine mount access doors, 452DL and 452DR or 462DL and 462DR
 - (c) Interface box system door, 451TZ or 461TZ
 - (d) Forward leading edge panel, 452AT or 462AT
 - (e) Nose fairing forward panel, 451AT or 461AT
 - (f) Nose fairing aft panel, 451BT or 461BT
- (61) Install glove fairing using glove fairing locator, and connect drag link and bonding straps.
- (62) Replace glove assembly doors 453AL and 453AR or 463AL and 463AR.
- (63) Replace LH and RH hinged cowls (Ref. 71-11-01 and 71-11-02).
- (64) Install interservices fairing LH and RH rear access panels (Ref. 72-03-00).
- (65) Remove splitter area access work platform.
- (66) Remove workstands and miscellaneous equipment from immediate area of the aircraft.

C. Removal (Sling)

- (1) Check status of aircraft systems for engine removal as follows:

R EFFECTIVITY: ALL

001B

71-00-01
Page 445
Jun 15/96

LOCKHEED
MAINTENANCE MANUAL

- (a) Ground aircraft to an approved grounding lug.
- (b) Provide electrical power (Ref. 24-41-00) as required.
- (c) Position applicable power control lever, zone 210, in fully retarded ground idle position. Ensure that thrust reverser lever is fully forward in ground idle position.
- (d) Depressurize applicable (A or D) hydraulic system and placard hydraulic system panels (Ref. 29-11-00).

CAUTION: THE FIRE EXTINGUISHING AGENT DISCHARGE SWITCH IS EXPOSED AND ARMED WHEN THE FIRE EMERGENCY ENGINE SHUTOFF CONTROL HANDLE HAS BEEN PULLED. DO NOT ACTUATE DISCHARGE SWITCH.

- (e) On the pilots overhead panel, zone 210, pull the applicable engine fire emergency shutoff control to close the firewall fuel and hydraulic shutoff valves (Ref. 28-24-07 and 29-11-32).
 - (f) On pilots overhead circuit breaker panel CB1, zone 210, open and tag applicable circuit breakers FIRE EXTINGUISHER MAIN and ALTN (C10 and C11 or C14 and C16), and THRUST REVERSE (H16 or H18), FUEL SHUTOFF VALVE-TANK-ENG-1 (D10) or ENG 3 (D12), and HYD PUMP & FIREWALL SHUTOFF VALVE CONT SYS A (L15) or SYS D (L18).
 - (g) Ensure that main landing gear wheels are chocked and all landing gear downlock safety pins are installed.
 - (h) Provide support, as necessary, for proper balance of aircraft (Ref. 7-11-00 and 10-20-00) during engine removal.
 - (i) Ensure that leading edge slats are retracted.
 - (j) Position workstands and platforms as required.
- (2) Remove applicable LH and RH hinged cowls, 413A and 424A, (Ref. Fig. 401), using floor crane and engine cowl panel sling set (Ref. 71-11-01 and 71-11-02). Place cowls on engine cowl panel dolly (Ref. Fig. 402).
- (3) Remove the following fairings and panels (Ref. Fig. 403), zone 410 or 430 (Ref. 6-40-00 and 6-50-00):

EFFECTIVITY: ALL

001B

71-00-01
Page 446
Jun 15/96



- (a) Nose fairing aft panel, 451BT or 461BT
 - (b) Nose fairing forward panel, 451AT or 461AT
 - (c) Forward leading edge panel, 452AT or 462AT
 - (d) Interface box system door, 451TZ or 461TZ
 - (e) Engine mount access doors, 452DL and 452DR or 462DL and 462DR
 - (f) Glove fairing doors, 453AL and 453AR or 463AL and 463AR
- (4) Disengage hinged cowl support structure (Ref. Fig. 404), zone 451 or 461, by removing the retaining pins.
 - (5) Remove starter duct section (Ref. Fig. 405), zone 451 or 561, by removing the double T-bolt V-band couplings (Ref. 20-36-02).
 - (6) Disconnect the intermediate-pressure (IP) duct (Ref. Fig. 406), zone 415 or 425, by removing the double T-bolt V-band coupling (Ref. 20-36-02).
 - (7) Disconnect IP duct seal (Ref. Fig. 406), zone 415 or 425, at pylon firewall.
 - (8) Position splitter access platform (Ref. Fig. 407), in cold-stream exhaust collector nozzle, zone 435.
 - (9) Remove interservices fairing LH and RH access panels, and LH and RH rear access panels to allow access to high-pressure (HP) duct disconnect.
 - (10) Disconnect the HP duct hoop plate seal and coupling (Ref. Fig. 406), zone 415 or 425, by removing the hoop plate seal clamp and HP duct double T-bolt V-band coupling (Ref. 20-36-02).
 - (11) Disconnect glove fairing linkage bonding straps (Ref. Fig. 403).
 - (12) Disconnect glove fairing drag link and remove glove fairing.
 - (13) Disconnect engine interface linkage rods from torque shaft assembly by removing cotter pins, nuts, and bolts (Ref. Fig. 408). Stow linkage rods for QEC unit removal. Do not remove the upper bushing, lower bushing, or lock-wire.



MAINTENANCE MANUAL

NOTE: The upper bushing is held in place by the lock-wire after the bolt has been removed and may be adjusted slightly for installation or removal of the linkage rod. The lower bushing is threaded and should not be moved.

- (14) Disconnect starter duct at engine interface (Ref. Fig. 409), zone 414 or 424, by removing double T-bolt V-band coupling (Ref. 20-36-02) and the support bolt, and cap starter duct.
 - (15) Disconnect anti-ice duct at engine interface (Ref. Fig. 409), zone 414 or 424, by removing cover and double T-bolt V-band coupling (Ref. 20-36-02), and cap anti-ice ducts.
 - (16) Disconnect, cap, and stow QEC electrical connectors (Ref. Fig. 410), zone 451 or 461.
 - (17) Disconnect and cap fuel shutoff valve seal drain and pylon interface box drain hose (Ref. Fig. 411), zone 414 or 424.
 - (18) Disconnect and cap IP reference pressure line (Ref. Fig. 412), zone 414 or 424. (Ref. Fig. 412), zone 414 or 424, then secure loose end to aircraft structure to prevent damage during engine removal and installation.
- CAUTION:** USE EXTREME CARE TO PREVENT DAMAGING HYDRAULIC HOSES BY BENDING, KINKING OR TWISTING.
- (19) Disconnect hydraulic suction, pressure, and case drain pump lines (Ref. Fig. 413), zone 414 or 424. Cover disconnects with protective caps to prevent contamination.
 - (20) Drain fuel from fuel supply line into a container by removing the drain plug (Ref. Fig. 414), zone 413 or 423. Reinstall drain plug and lock-wire.
 - (21) Disconnect and cap fuel lines.
 - (22) Attach trunnion fittings to QEC unit (Ref. Fig. 415), zones 414 or 424 and 413 or 423, as follows:
 - (a) Remove spherical bearings from engine stand forward supports, insert bearings into engine receptacle, and index for receiving trunnion bolts (Ref. Fig. 415).



MAINTENANCE MANUAL

NOTE: Ensure that spherical bearing is free of burrs and nicks before inserting bearing into receptacle fitting.

- (b) Remove forward supports from engine stand and attach to spherical bearings in engine receptacle fittings.
 - (c) Remove aft supports from engine stand and attach to engine with pins that secure links to bosses of handling plates.
- (23) Position multipurpose stand and transportation base below wing engine to be removed.

CAUTION: CLEARANCE MUST BE MAINTAINED BETWEEN SLING ASSEMBLY AND AIRCRAFT TO PREVENT DAMAGE TO SLATS AND PYLON.

- (24) Attach wing engine (Ref. Fig. 419) to overhead hoist and position sling above wing pylon.
- (25) Adjust slingheight to provide clearance for wrench between truss spreader bars and rear mount bolts.
- (26) Extend hoist chains and attach to applicable multipurpose stand pickup arms (Ref. Fig. 415).
- (27) Detach the swing bolts (Ref. Fig. 415) to release the multipurpose stand from the transportation base.

CAUTION: ENGINE TO STAND CLEARANCE IS EXTREMELY TIGHT. CLOSE ALIGNMENT MUST BE MAINTAINED DURING ALL OPERATIONS.

- (28) Hoist multipurpose stand to approximate position for attachment to QEC unit.
- (29) Attach supports to multipurpose stand.

NOTE: Adjust height of multipurpose stand as necessary to allow attachment of trunnions.

CAUTION: DO NOT EXCEED 7000 LB LOAD ON A SINGLE FORWARD HOIST OR 4500 LB ON A SINGLE REAR HOIST. MAINTAIN EQUAL SIDE-TO-SIDE LOADS WITHIN 1000 LB BETWEEN THE FRONT DYNAMOMETERS AND BETWEEN THE REAR DYNAMOMETERS.

- (30) Preload dynamometers to ensure that hoists accept weight of engine and multipurpose stand as follows:

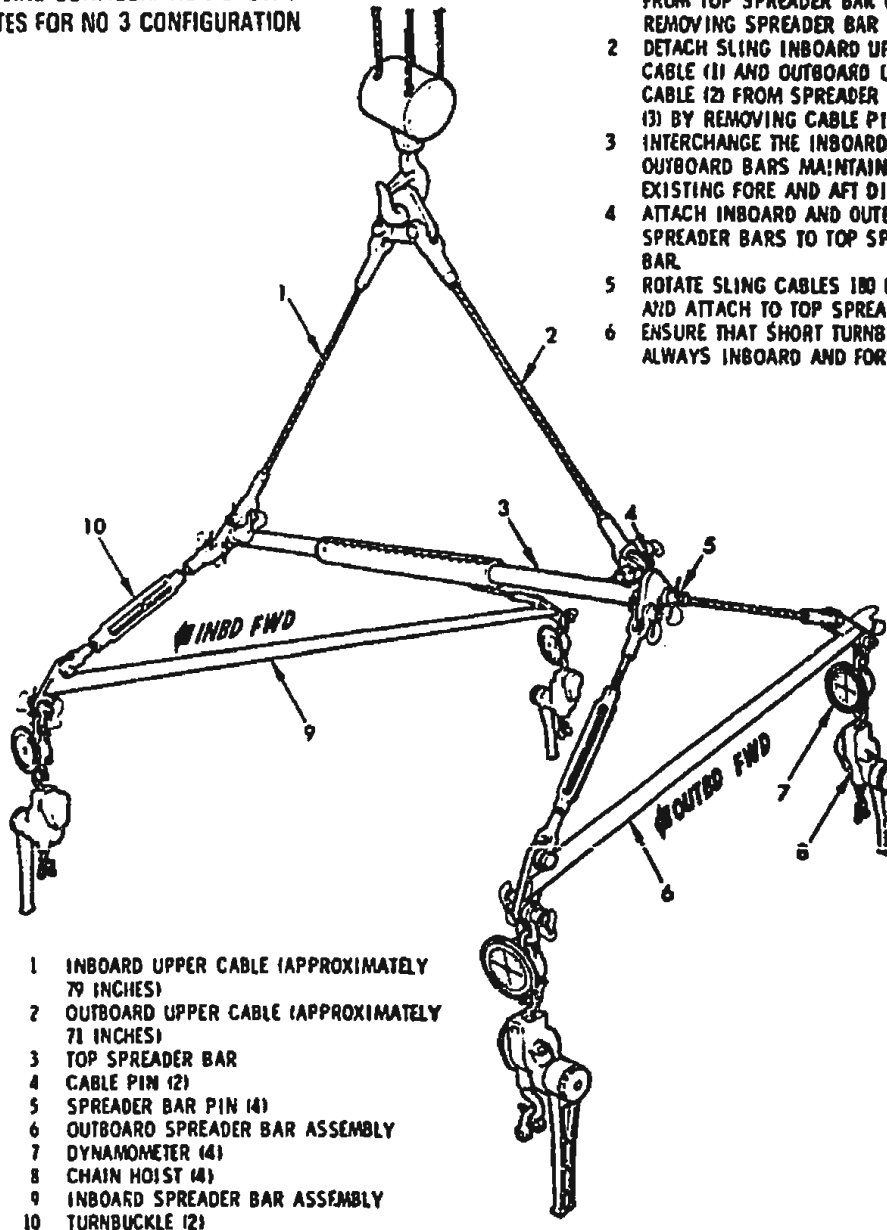
R EFFECTIVITY: ALL

001B

71-00-01
Page 449
May 15/82

LOCKHEED
MAINTENANCE MANUAL

NO 1 ENGINE CONFIGURATION SHOWN
REF NOTES FOR NO 3 CONFIGURATION



NOTE

- 1 DETACH INBOARD SPREADER BAR ASSEMBLY (9) AND OUTBOARD SPREADER BAR ASSEMBLY (6) FROM TOP SPREADER BAR (3) BY REMOVING SPREADER BAR PINS (5).
- 2 DETACH SLING INBOARD UPPER CABLE (1) AND OUTBOARD UPPER CABLE (2) FROM SPREADER BAR (3) BY REMOVING CABLE PINS (4).
- 3 INTERCHANGE THE INBOARD AND OUTBOARD BARS MAINTAINING EXISTING FORE AND AFT DIRECTION.
- 4 ATTACH INBOARD AND OUTBOARD SPREADER BARS TO TOP SPREADER BAR.
- 5 ROTATE SLING CABLES 180 DEGREES AND ATTACH TO TOP SPREADER BAR.
- 6 ENSURE THAT SHORT TURNBUCKLE IS ALWAYS INBOARD AND FORWARD.

- 1 INBOARD UPPER CABLE (APPROXIMATELY 79 INCHES)
- 2 OUTBOARD UPPER CABLE (APPROXIMATELY 71 INCHES)
- 3 TOP SPREADER BAR
- 4 CABLE PIN (2)
- 5 SPREADER BAR PIN (4)
- 6 OUTBOARD SPREADER BAR ASSEMBLY
- 7 DYNAMOMETER (4)
- 8 CHAIN HOIST (4)
- 9 INBOARD SPREADER BAR ASSEMBLY
- 10 TURNBUCKLE (2)

HH 9917
M1-0101-71-447

Wing Engine Sling
Figure 420

R R
001B EFFECTIVITY: ALL

71-00-01
Page 450
May 15/82

LOCKHEED
MAINTENANCE MANUAL

- (a) Determine weight of engine multipurpose stand.
- (b) Add No. 1 or 3 engine weight of 13,090 lbs, weight of multipurpose stand, and 1000 lbs preload for a total load.
- (c) Distribute the load approximately as follows:
 - 70 percent equally divided between two forward hoists
 - 30 percent equally divided between two rear hoists

WARNING: THE ENGINE MOUNT BOLTS MAY NOT BE LOOSENED BEFORE TAKING UP THE ENGINE WEIGHT WITH THE HOISTING EQUIPMENT.

- (31) Remove bolts (Ref. Fig. 417), zone 452 or 462, from QEC unit front and rear mounts. Tool GL-72-HA-1 (Ratchet Adapter) may be used to place a socket on the bolt head.

NOTE: If thread damage is evident on mount bolts, inspect nuts for thread wear or damage.

CAUTION: MAINTAIN SUFFICIENT CLEARANCE BETWEEN THE SLING AND THE PYLON TO PREVENT DAMAGE TO THE PYLON.

- (32) Lower QEC unit and multipurpose stand slowly, guiding them free of all interfaces with the pylon, and position them above the transportation base.

NOTE: On engines with RR SB78-3753, ensure that the left rear corner of the hinged cowl support structure clears the thrust reverser translating cowl proximity sensor harness.

- (33) Rotate QEC unit and multipurpose stand to vertical centerline position before mounting on transportation base.

NOTE: QEC unit installed position is in 5-1/2 degree roll outboard.

- (34) Lower and secure multipurpose stand to transportation base (Ref. Fig. 415) properly positioning and tightening swing bolts.

EFFECTIVITY: ALL

71-00-01
Page 451
Mar 15/83

001B



MAINTENANCE MANUAL

- (35) Inspect exposed surfaces of V-flange seals (E-seals) in all interface ducts for deformation, nicks, dents, cuts, or cracks. Remove and replace damaged seals.

NOTE: E-seals are manufactured slightly out-of-round for a secure fit in male portion of ducting joints. Most common defects will be nicks, dents, cuts, or deformation from a flat plane. Do not remove any seals if they appear to be in satisfactory condition.

- (36) Place duct covers over QEC unit and related aircraft exposed ducts.
- (37) Disconnect wing engine sling from multipurpose stand and overhead hoist.
- (38) Remove splitter area access work platform from cold-stream collector.
- (39) Move transportation base to clear area for replacement of QEC unit.

D. Installation (Sling)

- (1) Check that aircraft is in configuration established for removal, Step 3C(1).

NOTE: The thrust reverser airmotor oil reservoir can be filled and the level checked while the engine is installed on the multi-purpose stand by using the No. 2 engine position full mark on the airmotor oil dipstick. This oil level will then be correct when the engine is installed in any of the three positions on the aircraft.

CAUTION: ENGINE MOUNT NUTS, BOLTS, AND MOUNT BOLT HOLES MUST BE INSPECTED EACH INSTALLATION FOR SCORES, BURRS, AND ABRASIONS.

PRIOR TO AND DURING ENGINE INSTALLATION, CHECK THAT ENGINE FRONT AND REAR MOUNTS UPPER AND LOWER SURFACES, BOLT HOLES AND SHEAR PIN BLIND HOLES (THESE LOCATE WITH AIRFRAME MOUNTED SHEAR PINS) ARE FREE FROM DAMAGE, OIL, GREASE OR ANY OTHER FOREIGN MATERIAL. USING SOLVENT, WIPE CLEAN AS NECESSARY.

- (2) Inspect engine mount bolts and mount bolt holes each installation. Inspect nuts for cracks, thread wear or damage, and loose fit. Noticeable distortion or scratches deep enough to reduce efficiency of the

EFFECTIVITY: ALL

71-00-01
Page 452
Nov 15/85

LOCKHEED
MAINTENANCE MANUAL

threads is cause for rejection. The threads must remain in a serviceable condition and permit free installation with the fingers up to the self locking element. Reject bolts and nuts having stripped or cross threaded threads. If bolt/nut combinations, lubricated with MIL-T-5544, do not have a back-off breakaway torque of at least 70 pound-inches (back-off breakaway torque refers to minimum torque required after initial unseating), or if the free running torque while tightening is more than 800 pound-inches, reject the used nut. If same torque requirements cannot be met with a new nut, reject the bolt. Burrs, abrasions, or score marks must be fingernail smooth (Ref. Table 401 and Fig. 402) with the following limitations. [Bushings requiring rework beyond maximum limits must be replaced (Ref. 54-11-01)]:

- (a) Rework is not permitted on the bolt shank within 0.3 inch of the bolt head.

NOTE: Limit does not apply to Vibratory Rework Method.

- (b) Rework must be held to a minimum, with a smooth transition from the normal diameter to the rework diameter. See Figure 421.
- (c) The root radius of any score or scratch must be smoothed to 0.090 inch.
- (d) Machine-powered grinding is not permitted on bolts or bushings.
- (e) Rework bolthead flat surface to a maximum depth of .003 inches. Rework to be done by hand.

NOTE: If hand reworking is impractical, see Structural Repair Manual 54-00-00 for alternate method.

CAUTION: THE FORK MUST BE INSTALLED IN ALIGNMENT PIN GROOVE PRIOR TO SECURING PIN IN MOUNT TO CONTROL PIN PENETRATION AND PREVENT DAMAGE TO MOUNT BOLT NUTS.

- (3) Install alignment pins (Ref. Fig. 417 and Fig. 418) into aircraft side of engine front mount and thread alignment pins into engine side of engine rear mount (one pin in forward hole and one in diametrically opposite rear hole of each mount).

NOTE: The long shank of front mount alignment pin is the handle for inserting pin in engine mount.

R EFFECTIVITY: ALL

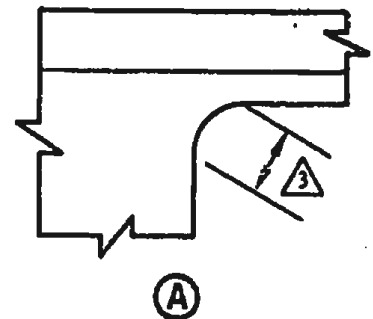
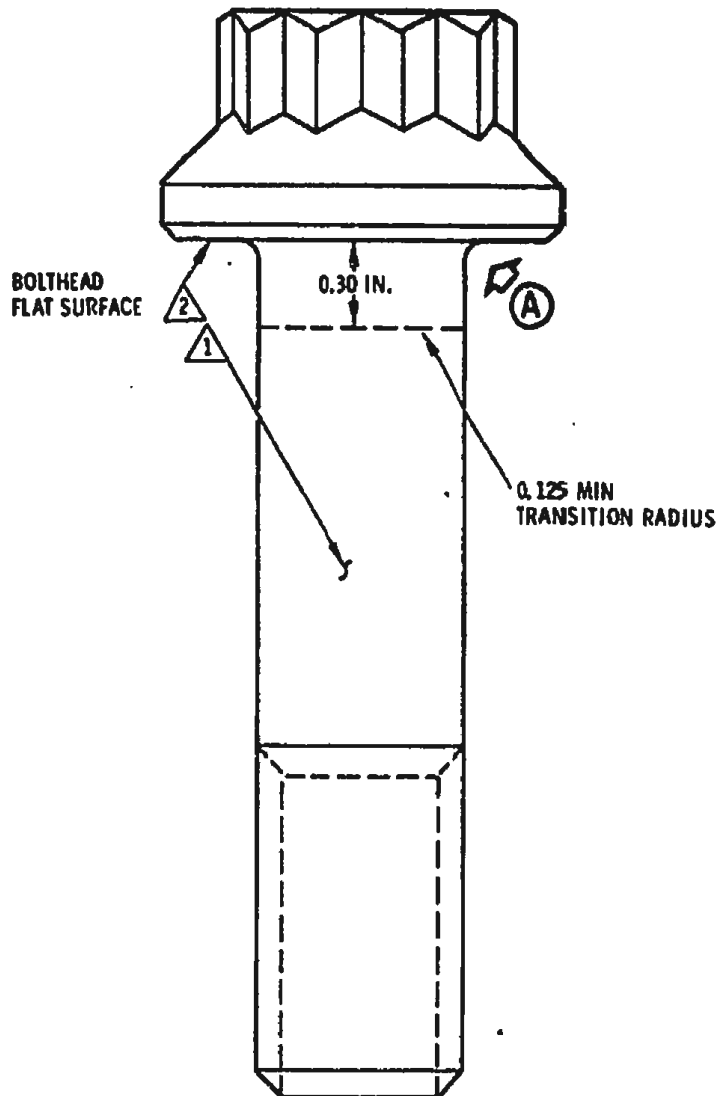
001B

71-00-01
Page 453
Nov 15/85

LOCKHEED



MAINTENANCE MANUAL



CAUTION

NO POWER GRINDING PERMITTED

NOTE

- 1 LIGHT SCUFFS AND SCRATCHES THAT CANNOT BE FELT WITH THE FINGERNAIL REQUIRE NO REWORK. ABRASIONS, SCUFFS, SCRATCHES OR SCORES THAT CAN BE FELT WITH THE FINGERNAIL MUST BE FAIRED OUT TO BLEND SMOOTHLY WITH THE BOLT SHANK. BOLT DIAMETER AFTER REWORK MUST NOT BE LESS THAN 0.9880 INCHES AT ANY POINT.
- 2 CIRCUMFERENTIAL SCRATCHES, SCORES OR GROOVES ON THE FLAT OF THE BOLT HEAD ARE PERMISSIBLE TO A MAXIMUM DEPTH OF 0.003 INCHES.
- 3 NO REWORK PERMITTED IN THIS AREA (DOES NOT APPLY TO VIBRATORY METHOD OF REWORK)

M1-0000-71-093

CR
CR

Engine Mount Bolt Limitation
Figure 421

EFFECTIVITY: ALL

001B

71-00-01
Page 454
Nov 15/83



MAINTENANCE MANUAL

- (4) Ensure that the IP, HP, starter, and anti-icing duct E-seals are serviceable and installed properly (Ref. Fig. 406 and 409).
- (5) Install aircraft linkage rig pin and engine linkage rig pin (Ref. Fig. 408).

NOTE: With engine power control lever secured in fully retarded position, it may be necessary to pull reverse thrust control lever, zone 210, toward reverse position and to release it in the idle position to align rig pin holes.

- (6) Lubricate QEC unit mount bolts under bolt head, on shank, and on threads.

CAUTION: WHEN INSTALLING A REVERSER, WHETHER BY ITSELF OR AS PART OF A REPLACEMENT ENGINE, ALWAYS CONFIRM THE CASCADE CONFIGURATION AGAINST MAINTENANCE MANUAL CHARTS AND MAKE CERTAIN IT IS CONFIGURED FOR THE ENGINE POSITION FOR WHICH IT IS TO BE INSTALLED (REF. 78-31-20).

- (7) Place replacement QEC unit in position under wing pylon in preparation for installation.
- (8) Ensure splitter area access work platform has been installed.

CAUTION: CLEARANCE MUST BE MAINTAINED BETWEEN SLING ASSEMBLY AND AIRCRAFT TO PREVENT DAMAGE TO SLATS AND PYLON.

- (9) Attach wing engine sling to overhead hoist and position sling above pylon.
- (10) Adjust sling height to provide clearance for torque wrench between truss spreader bars and rear mount bolts.
- (11) Extend hoist chains and attach to applicable multipurpose stand pickup arms (Ref. Fig. 415).
- (12) Detach swing bolts (Ref. Fig. 415) to free multipurpose stand from the transportation base.
- (13) Actuate manual hoist to remove slack from cables until each dynamometer indicates approximately 1000 lb.
- (14) Remove protective covers and caps from ducts and openings.

R EFFECTIVITY: ALL

001B

71-00-01

Page 455
Mar 15/83



CAUTION: THE WING PYLON FRONT AND REAR ENGINE MOUNT SHEAR PINS MUST BE SECURED IN THE PYLON ENGINE MOUNTS PRIOR TO ENGINE INSTALLATION.

- (15) Raise QEC unit until alignment can be visually determined (approximately 4 inches below mounts).
- (16) During all phases of mating the QEC unit to the wing pylon, monitor all interfaces for proper clearance. Apply roll outboard as necessary.
- (17) Raise rear section of QEC unit slowly, aligning hinged cowl support structure rear fittings and QEC rear mount. Stop hoist action when rear mounts are just far enough apart (approximately three-eighths inch) to allow removal of alignment pin forks.

R

R
R
R
R
R

NOTE: On engines with RR SB78-3753, ensure that the left rear corner of the hinged cowl support structure clears the thrust reverser translating cowl proximity sensor harness.

- (18) Mate the hinged cowl support structure rear fittings (Ref. Fig. 404) to the QEC unit pip pin receptacle and install pip pins.

CAUTION: DO NOT ALLOW ENGINE WEIGHT TO BE TAKEN UP BY BOLTS.

- (19) Install two bolts in rear mount bolt holes that do not contain alignment pins (Ref. Fig. 417), remove rear mount alignment pins and install remaining two bolts. The bolts should be finger tight.
- (20) Raise front section of QEC unit to approximately one-eighth inch of front mount, aligning hinged cowl support structure front fittings and QEC front mount.
- (21) Install hinged cowl support structure front pip pins (Ref. Fig. 404).

CAUTION: DO NOT ALLOW ENGINE WEIGHT TO BE TAKEN UP BY BOLTS.

- (22) Install two bolts, washers and nuts in front mount bolt holes that do not contain alignment pins (Ref. Fig. 417), remove front mount alignment pins and install remaining two bolts. The bolts should be finger tight.

EFFECTIVITY: ALL

001B

71-00-01
Page 456
Mar 15/83



MAINTENANCE MANUAL

NOTE: Washer countersink position is immaterial in engine No. 1 or No. 3 installation as mount bolt head contacts bushing.

CAUTION: DO NOT EXCEED 7000 LB LOAD ON A SINGLE FORWARD HOIST OR 4500 LB ON A SINGLE REAR HOIST. MAINTAIN EQUAL SIDE-TO-SIDE LOADS WITHIN 1000 LB BETWEEN THE FRONT DYNAMOMETERS AND BETWEEN THE REAR DYNAMOMETERS.

- (23) Raise QEC unit to engage front and rear mounts. Apply an upward load of (preload, in addition to the engine and stand weight) approximately 500 lbs on each mount pad (250 lbs per dynamometer).

NOTE: Verify that bolt threads and nut self locking feature have been checked as required in Step D(2).

- (24) Torque all mount bolts to 700 (± 50) lb ft. The bolts at each mount pad are to be torqued first across the diagonals, then in sequence around the bolt pattern so that each bolt is torqued twice.

NOTE: If access to the bolts is difficult, tool No. GL-72-HA-1 (Ratchet Adapter) may be used as per Fig. 419, paying close attention to the torque application chart.

In the event engine mount bolts are incorrectly torqued, assuming they have not been torqued to more than 950 lb ft, retorquing can be accomplished as follows:

- (a) Loosen each bolt, following the torque pattern, and retorque before loosening next bolt.
- (b) Removal of any bolt for inspection can be accomplished during the sequence.

NOTE: After mount bolts are properly torqued, clean area on the bolt and mount and apply tamper proof putty (TWA Stk. Nbr 50-1065) at approximately 0.5 inch diameter

- (25) Decrease load until dynamometers indicate approximately weight of multipurpose stand and detach trunnion bolts, trunnions, spherical bearings, and supports from QEC unit (Ref. Fig. 416).

CAUTION: MAINTAIN SUFFICIENT CLEARANCE BETWEEN THE SLING AND THE PYLON TO PREVENT DAMAGE TO THE PYLON.

EFFECTIVITY: ALL

001B

71-00-01
Page 457
Dec 15/91

LOCKHEED
MAINTENANCE MANUAL

- (26) Lower and secure the stand to the transportation base.
 - (27) Detach the wing engine sling from the multipurpose stand and overhead hoist.
 - (28) Remove transportation base from area.
 - (29) Connect HP duct hoop plate seal and coupling (Ref. Fig. 406), zone 415 or 425. Secure with hoop plate seal clamp and HP duct double T-bolt V-band coupling (Ref. 20-36-02).
- NOTE: It may be necessary to use a wood or micarta block approximately 30 inches long, 3-3/4 inches high, and 1-3/4 inches wide to assist in connecting HP duct.
- (30) Connect IP duct seal and IP duct (Ref. Fig. 406), zone 415 or 425, and secure duct with double T-bolt V-band coupling (Ref. 20-36-02).
 - (31) Install the starter duct section (Ref. Fig. 405), zone 452 or 462, and secure with double T-bolt V-band couplings (Ref. 20-36-02).
 - (32) Connect starter duct (Ref. Fig. 409), zone 414 or 424, and secure with double T-bolt V-band coupling (Ref. 20-36-02).
 - (33) Connect starter duct support rod if it has been detached.
 - (34) Connect anti-icing duct and secure with double T-bolt V-band coupling (Ref. 20-36-02).
 - (35) Connect engine (throttle) interface linkage rods (Ref. Fig. 408).
 - (36) Remove and stow engine linkage and aircraft linkage rig pins.
 - (37) Ensure that hoop plate suspension links are connected (Ref. Fig. 417).
 - (38) Connect fuel shutoff valve seal drain and pylon interface box drain hose (Ref. Fig. 411).
 - (39) Remove cap and securing device and connect IP reference pressure line (Ref. Fig. 412) to IP reference connector.

R EFFECTIVITY: ALL

001B

71-00-01
Page 458
Dec 15/91

LOCKHEED
MAINTENANCE MANUAL

NOTE: On engines incorporating RR SB72-2149, verify that unused P1 connection is blanked and lockwired.

CAUTION: USE EXTREME CARE TO PREVENT DAMAGING HYDRAULIC HOSES BY BENDING, KINKING OR TWISTING. PREVENT INTRODUCTION OF TWISTING PRELOAD IN HOSES WHEN TIGHTENING FITTINGS.

- (40) Remove caps and connect hydraulic pressure, suction, and case drain lines (Ref. Fig. 413).

NOTE: Verify that hydraulic lines, from disconnects to pumps, have been filled with hydraulic fluid.

- (41) Remove caps and connect fuel line (Ref. Fig. 414).

CAUTION: HAND TIGHTEN ELECTRICAL CONNECTOR PLUG SHELLS ONLY UNTIL THE FULLY COUPLED INDICATOR LINE IS COVERED AND THE THREADS HAVE BOTTOMED OUT TO ENSURE SELF LOCKING FEATURE HAS ENGAGED.

- (42) Remove caps from electrical plugs and receptacles (Ref. Fig. 410) and connect plugs.

NOTE: Ensure that harnesses P, S, C2, T, E, Q1, and G are secured to the first and second clip/clampblocks securing harnesses to engine.

- (43) Verify that electrical power is provided to the aircraft (Ref. 24-41-00).

- (44) Remove tags and close circuit breakers opened in Step 3C(1)(f).

- (45) Push in engine fire emergency shutoff control handle, zone 210, to open the firewall fuel and hydraulic shutoff valves (Ref. 28-24-07 and 29-11-32).

- (46) Pressure-check fuel system (Ref. 28-24-00) for leaks at fuel disconnect and drain plug.

NOTE: If the engine is installed with inhibiting oil in the fuel system, the inhibiting oil can be removed by wet motoring then dry motoring the engine before attempting an engine start (Ref. 71-00-00).

- (47) Pressure-check bleed air system (Ref. 71-00-01) for leaks at IP, HP, anti-ice, and start duct interface disconnects.

R EFFECTIVITY: ALL
R
001B

71-00-01
Page 459
Dec 15/91

LOCKHEED
MAINTENANCE MANUAL

- (48) On engines without RR SB75-3594, perform air inlet shutoff valve operational test (Ref. 75-21-04).
- (49) Service engine oil system (Ref. 12-12-01).
- (50) Service engine starter (Ref. 12-12-11).
- (51) Service thrust reverser motor (Ref. 12-12-71).
- (52) Service integrated drive generator oil system (Ref. 12-12-21).
- (53) Perform integrated drive generator Disconnect Test (Ref. 24-11-01).
- (54) Perform pump priming and air bleeding operations (Ref. 29-11-07) then remove placards from hydraulic system panels.
- (55) Perform hydraulic system firewall shutoff valve Operational Test and hydraulic pump depressurization solenoid check (Ref. 29-11-32).
- (56) Perform fuel system firewall shutoff valve operational test (Ref. 28-24-07).
- (57) Perform fire extinguisher container inspection (Ref. 26-21-01).
- (58) Install the following fairings and panels (Ref. Fig. 403), zone 410 or 430 (Ref. 6-40-00 and 6-50-00):
 - (a) Thrust reverser interface fairings, 435AL and 435AR
 - (b) Engine mount access door, 452DL and 452DR or 462DL and 462DR
 - (c) Interface box system door, 451TZ or 461TZ
 - (d) Cover, 451VZ or 461VZ
 - (e) Forward leading edge panel, 452AT or 462AT
 - (f) Nose fairing forward panel, 451AT or 461AT
 - (g) Nose fairing aft panel, 451BT or 461BT
- (59) Install glove fairing using glove fairing locator, and connect drag link and bonding straps.

R
R
001B

EFFECTIVITY: ALL

71-00-01
Page 460
Dec 15/91

LOCKHEED



MAINTENANCE MANUAL

- (60) Replace glove assembly doors, 453AL and 453AR or 463AL and 463AR.
- (61) Replace LH and RH hinged cowls (Ref. 72-11-01 and 72-11-02).
- (62) Install interservices fairing LH and RH rear access panels (Ref. 72-03-00).
- (63) Remove splitter area access work platform.
- (64) Remove workstands and miscellaneous equipment from immediate area of the aircraft.

R
R

001B

EFFECTIVITY: ALL

71-00-01
Page 461/462
Dec 15/91

LOCKHEED



MAINTENANCE MANUAL

CR
CR

FUSELAGE - MOUNTED QEC UNIT (ENGINE NO. 2)
MAINTENANCE PRACTICES

CR

SECTION DELETED

R
R
003B

EFFECTIVITY: ALL

71-00-03
Page 201/202
Nov 15/83



FUSELAGE-MOUNTED QEC UNIT (ENGINE NO. 2)
REMOVAL AND INSTALLATION

1. Equipment and Materials

Containers (approved for fuel, oil, and hydraulic fluids)

Plastic protective caps

Oil Servicing Cart, Model 550 LPT, Loe Industries, or equivalent

Antiseize compound MIL-T-5544 or equivalent

Overhead crane (15-ton capacity and 60-foot-high lift)

Engine Installation Tool Kit, PN BC-55, or equivalent

Center Engine Sling, PN 673307, or equivalent

No. 2 Engine Cowl Panels Dolly, PN B669, or equivalent

No. 2 Engine Crossbeam Bootstrap Assembly, PN BG01-103 or equivalent

R Multipurpose Engine Stand, PN CP30000/12/13/17 or CP30860/1, Rolls-Royce Ltd., or equivalent

Transportation Base, PN CP30011/4, Rolls-Royce Ltd., or equivalent

Adapter Kit Hoist, PN CP30010 or CP30058 or CP30620, Rolls-Royce Ltd., or equivalent

R Drawbar/axle assembly (used with CP30000/12/13/17 or CP30860/1) PN CP30139/2 or PN CP30515/1 Rolls Royce Ltd., or equivalent

Tow Bar PN CP30516 (used with CP30515/1) Rolls Royce Ltd., or equivalent

Splitter Area Access Work Platform, PN CP20309 or XUT 37594 or (XUT 42526 and XUT 42527), Rolls-Royce Ltd., or equivalent

Engine Cowl Panel Sling Set, PN B674, or equivalent

No. 2 Engine Workstand, PN DPD30020, or equivalent

Engine Mounts Alignment Pins, PN BM35-101, or equivalent

Engine Power Controls Rigging Kit, PN B996, or equivalent

EFFECTIVITY: ALL

001B

71-00-03

Page 401
Dec 15/93



MAINTENANCE MANUAL

S-duct Adapter Alignment Tool, PN BG11 or BG15, or equivalent
 S-duct Support Strap, Local Manufacture (Ref. Fig. 408)
 Control Column Lock, PN BA80, or equivalent
 Lock-wire, Fed Spec QQ-W-390, 0.032-inch diameter, or equivalent
 Lubricant, MIL-T-5544, or equivalent

C Pneumatic Hoists (4); 3-ton capacity each; Ingersol-Rand No.
 C HLA-60A, or equivalent.
 C Deicer - Compressed Air Supply; Tanner T-90 or equivalent.
 C Deicer Fluid - Compressed Air Supply; Tanner T-5 or equivalent.
 C Pneumatic Hoist Lub. Oil (4 qt.) - Ingersol Rand Med.
 C Industrial Oil No. 45 or equivalent oil meeting AGMA Standard
 C No. 2

2. Referenced Procedures

6-40-00	Exterior Access Doors and Panels
7-11-00	Wing and Fuselage Jacking - Maintenance Practices
10-20-00	Mooring - Maintenance Practices
12-12-01	Engine Oil Replenishing - Servicing
12-12-11	Engine Starter Oil Replenishing - Servicing
12-12-21	Integrated Drive Generator (IDG) Oil Replenishing - Servicing
12-12-71	Thrust Reverser Air Motor - Servicing
20-36-02	Double T-Bolt V-Band Coupling - Removal and Installation
24-11-01	IDG Assembly - Adjustment and Test
24-41-00	External Power/Ground Service System - Maintenance Practices
28-24-00	Engine Feed System - Adjustment and Test
28-24-10	Firewall Shutoff Valve, Engine No. 2 - Adjustment and Test

R EFFECTIVITY: ALL

001B

71-00-03
 Page 402
 Jun 15/93



29-11-00	Hydraulic Power System - Maintenance Practices
29-11-07	Engine-Driven Hydraulic Pump - Removal and Installation
29-11-32	Hydraulic Firewall Shutoff Valve - Adjustment and Test
54-11-01	Wing Pylon Box Structure - Removal and Installation
71-00-00	Power Plant - Maintenance Practices
71-00-03	Fuselage-Mounted QEC Unit (Engine No. 2) - Maintenance Practices
71-12-01	LH and RH Lower Hinged Cowl - Removal and Installation
71-12-03	LH and RH Mid Fixed Cowl - Removal and Installation
71-12-05	LH and RH Upper Hinged Cowl - Removal and Installation
71-12-07	Air Intake Adapter - Inspection and Check
72-01-00	Oil System - Cleaning and Painting
72-03-00	Gas Generator Fairing - Removal and Installation
73-21-00	Engine Fuel Control System - Adjustment and Test

3. Removal/Installation

If an operator suspects that corrosive attack of main line bearings may occur during the period between engine removal and introduction into the overhaul shop, it is recommended that before the engine is removed from the aircraft the Cleaning/Painting procedure is accomplished (Ref. 72-01-00).

A. Removal (Bootstrap)

- (1) Check status of aircraft and systems and perform necessary functions in preparation for engine removal as follows:
 - (a) Ground aircraft to an approved grounding lug.
 - (b) Place engine No. 2 power control lever, zone 210, in fully retarded (ground idle) position. Ensure that thrust reverser lever is fully forward in ground idle position.

LOCKHEED



MAINTENANCE MANUAL

- (c) Provide electrical power (Ref. 24-41-00), as required.
- (d) Ensure that hydraulic system A pressure is available (Ref. 29-11-00) and retract tail skid with ground servicing control switch.
- (e) Depressurize hydraulic systems B and C (Ref. 29-11-00) and placard hydraulic system panels.

CAUTION: THE FIRE EXTINGUISHING AGENT DISCHARGE SWITCH IS EXPOSED AND ARMED WHEN THE FIRE EMERGENCY ENGINE SHUTOFF CONTROL HANDLE HAS BEEN PULLED. DO NOT ACTUATE DISCHARGE SWITCH.

- (f) On the pilots overhead panel, zone 210, pull engine No. 2 fire emergency shutoff control to close the firewall fuel and hydraulic shutoff valves (Ref. 28-24-10 and 29-11-32).

CAUTION: ENSURE CIRCUIT BREAKERS L3 AND H17 ON PILOTS OVERHEAD CIRCUIT BREAKER PANEL ARE OPEN TO PREVENT INADVERTENT DEPLOYMENT OF THE RAM AIR TURBINE.

- (g) On pilots overhead circuit breaker panel CB1, zone 210, open and tag circuit breakers FIRE EXTINGUISHER ENG 2 MAIN and ALTN (C12 and C13), THRUST REVERSE ENG 2 (H17), RAT AUTO DEPLOY (L3), FUEL SHUTOFF VALVE - TANK - ENG 2 (D11), and HYD PUMP & FIREWALL SHUTOFF VALVE CONT SYS B and SYS C (L16 and L17).
- (h) Install control column lock.
- (i) Ensure that main landing gear wheels are chocked and all landing gear downlock safety pins are installed.

CAUTION: BALLAST IS REQUIRED TO PREVENT AIRCRAFT TIPPING IF NO. 2 ENGINE IS INSTALLED WITH AIRCRAFT ON JACKS AND NO. 1 AND NO. 3 ENGINES REMOVED.

- (j) Provide support, as necessary, for proper balance of aircraft during engine removal (Ref. 7-11-00 and 10-20-00).
- (k) Position engine No. 2 workstand (Ref. Fig. 401) for maintenance.

R EFFECTIVITY: ALL

R
001B

71-00-03
Page 404
May 15/87

LOCKHEED



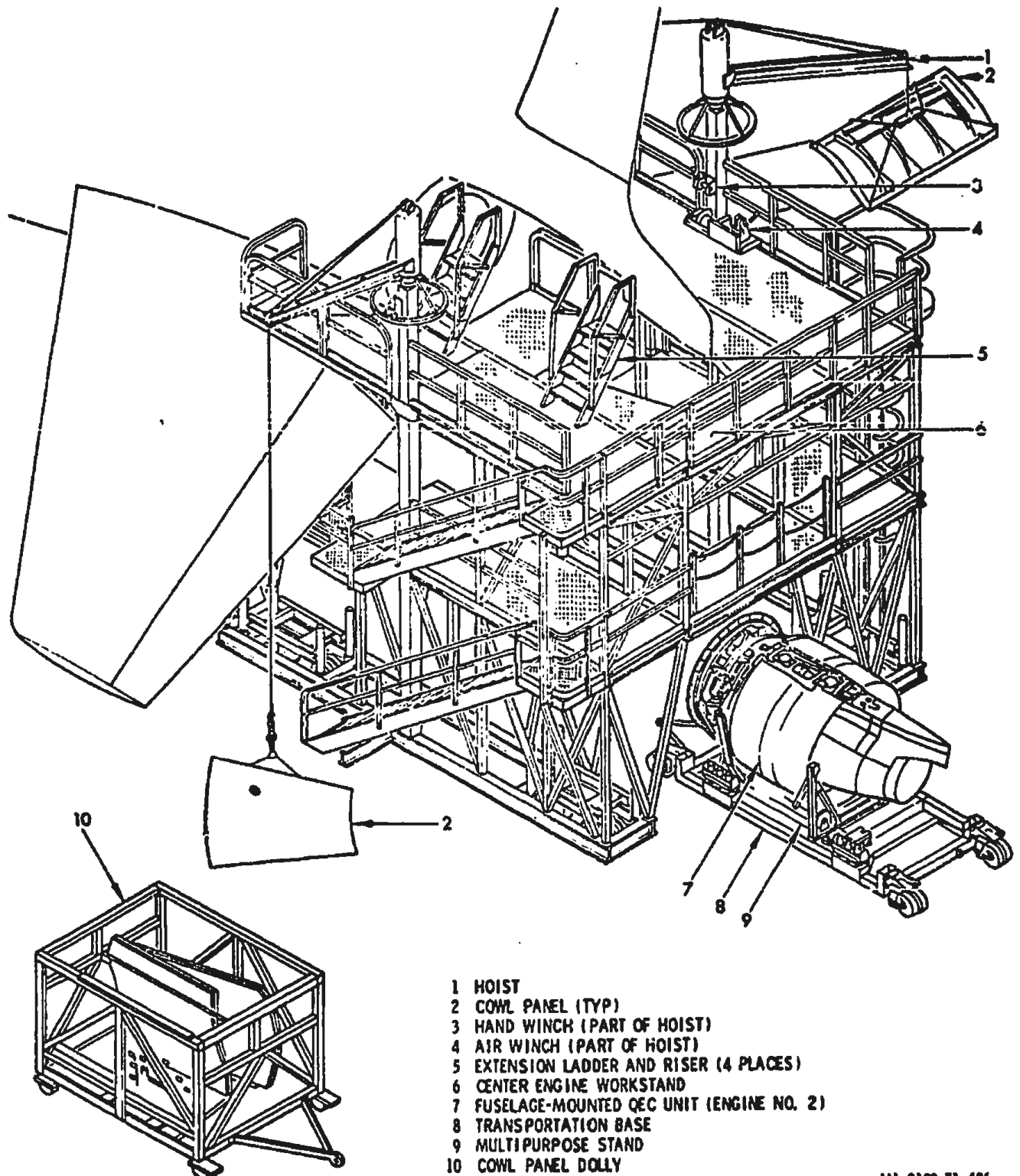
MAINTENANCE MANUAL

- C (l) Check oil level of the four bootstrap pneumatic
C hoists and service as required.
- C (m) If engine change is to be done under working
C conditions of 45°F or lower temperature, assure
C that compressed air supply lines for hoists are
C equipped with deicers.
- (2) Remove the following cowl panels, zones 433 and 434:
- (a) LH and RH upper hinged cowls, 433DL and 434DR (Ref. 71-12-05)
 - (b) LH and RH lower hinged cowls, 433AL and 434AR (Ref. 71-12-01)
 - (c) LH and RH mid fixed cowls, 433CL and 434CR (Ref. 71-12-03)
- NOTE: Replace barrel nuts if panel attach bolts do not meet a minimum back-off breakaway torque of at least 32 lb in.
- (3) Remove the following fairings, panels, and attachments (Ref. Fig. 402), zones 471 and 472 (Ref. 6-40-00):
- (a) Thrust reverser hoop plate fairing assemblies, 435BL and 435BR
 - (b) Thrust reverser fairing panels, 435AL and 435AR
 - (c) Firewall access door assemblies, 471CL and 471BR
 - (d) Rear mount access doors, 471EL and 471DR
 - (e) Glove assembly doors, 472DL and 472DR
 - (f) Drag link bolt and bonding strap bolts
 - (g) Support structure glove assembly, 472C
 - (h) Aft fairing access panels 472CL and 472CR
- NOTE: Tri-wing screws in firewall access doors, rear mount access doors, and aft fairing access panels may be replaced with hex head bolts to reduce removal and installation time.
- (4) Remove bolts attaching cowl seal assembly to center engine support structure (Ref. Fig. 403). Pull seal

R EFFECTIVITY: ALL
R
001B

71-00-03
Page 405
May 15/87

LOCKHEED
MAINTENANCE MANUAL



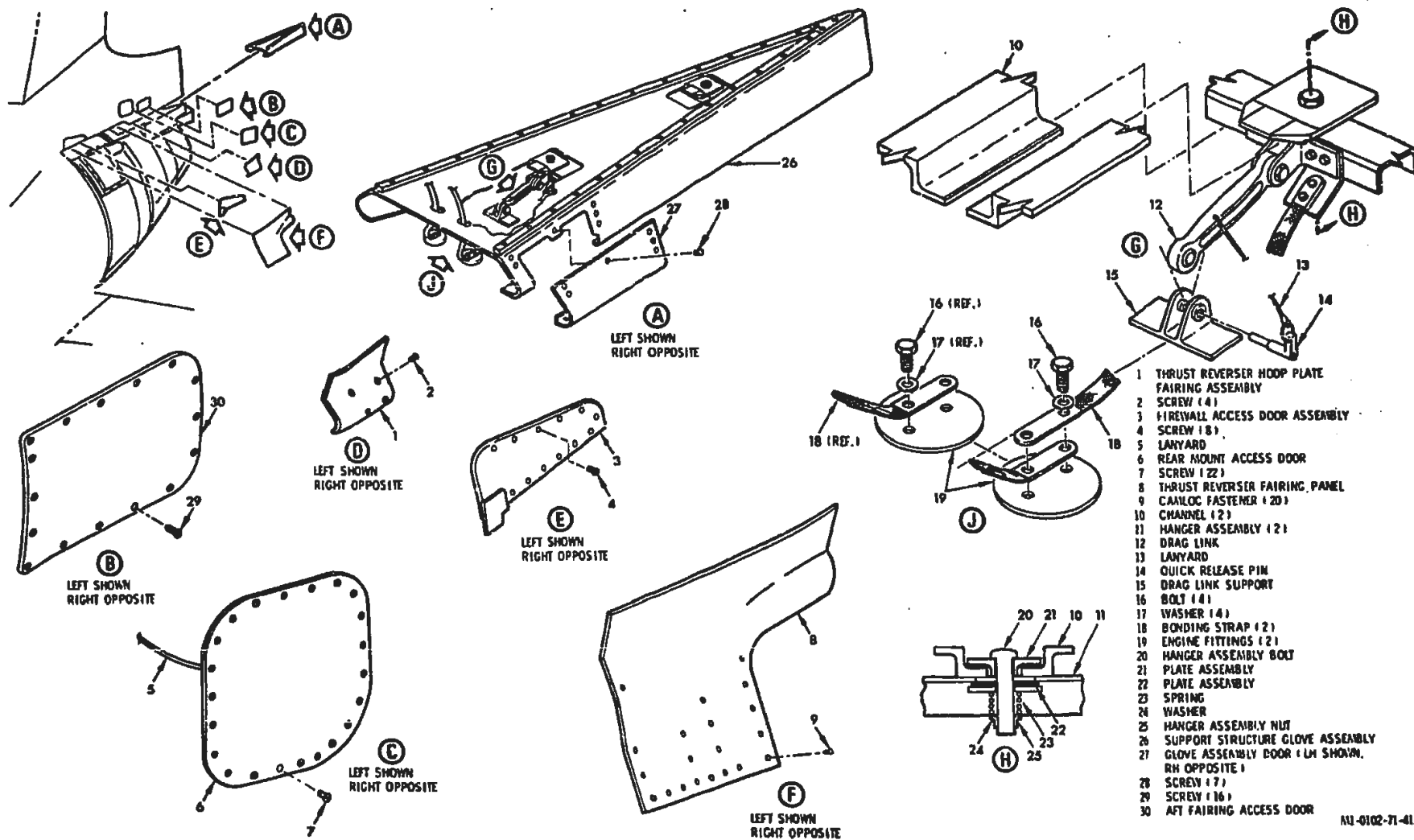
- 1 HOIST
- 2 COWL PANEL (TYP)
- 3 HAND WINCH (PART OF HOIST)
- 4 AIR WINCH (PART OF HOIST)
- 5 EXTENSION LADDER AND RISER (4 PLACES)
- 6 CENTER ENGINE WORKSTAND
- 7 FUSELAGE-MOUNTED OEC UNIT (ENGINE NO. 2)
- 8 TRANSPORTATION BASE
- 9 MULTIPURPOSE STAND
- 10 COWL PANEL DOLLY

M1-0103-71-406

Center Engine Workstand
Figure 401

R EFFECTIVITY: ALL
R
001B

71-00-03
Page 406
May 15/87



Engine No. 2 Access Fairings and Panels
Figure 402

EFFECTIVITY: ALL

001B

71-00-03
Page 407/408
May 15/77

AI-0102-71-412



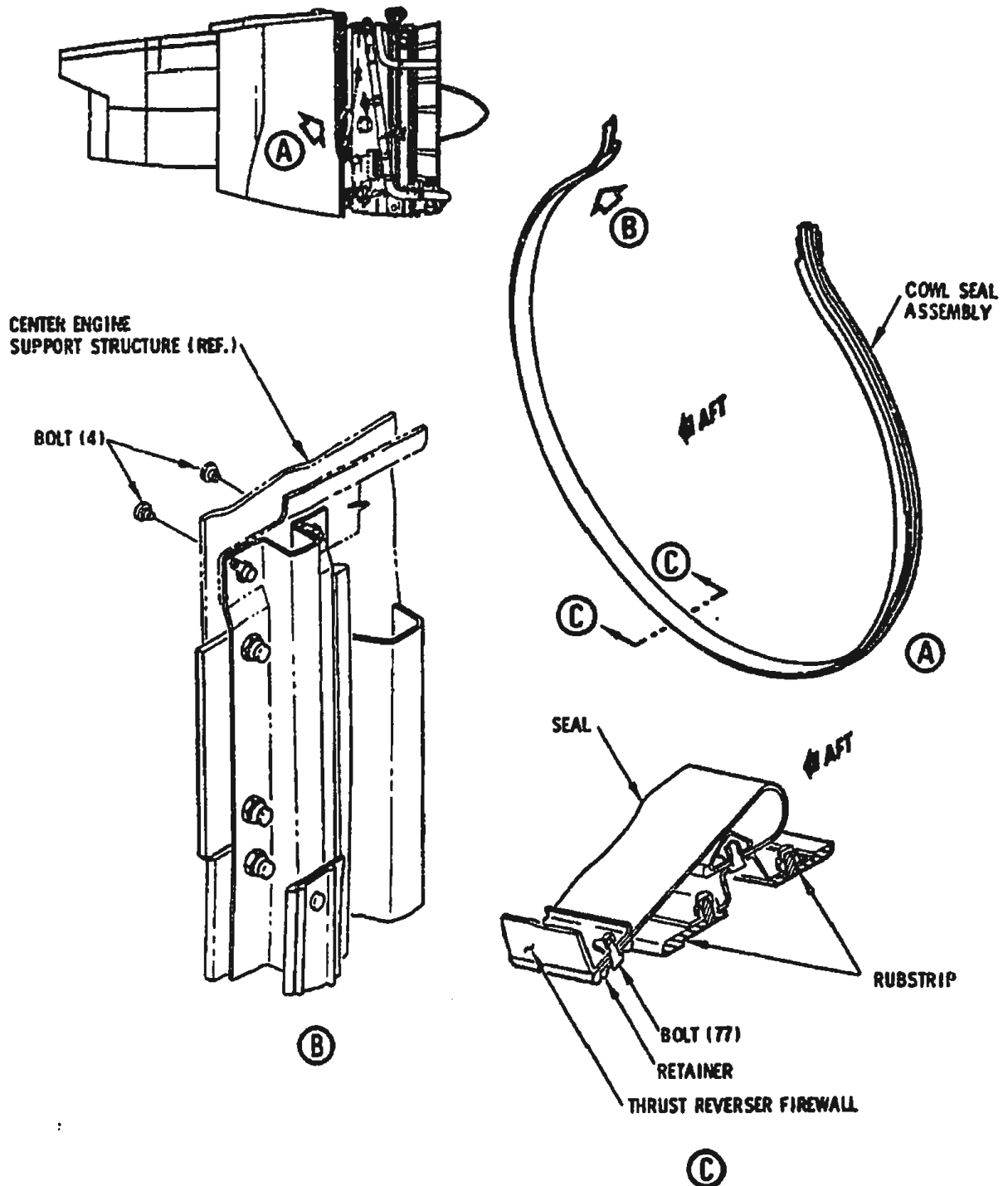
assembly rub strips and seal aft over thrust reverser firewall for stowage.

- (5) Inspect cowl seal for damage and retain attaching parts for reinstallation.
- (6) Disconnect intermediate-pressure (IP) duct coupling (Ref. Fig. 404), zone 471, by removing double T-bolt V-band coupling (Ref. 20-36-02).
- (7) Position splitter area access work platform (Ref. Fig. 405) in cold-stream exhaust collector and nozzle, zone 435.
- (8) Remove interservices fairing LH and RH access panels and LH and RH rear access panels to allow access to high-pressure (HP) duct disconnect (Ref. 72-03-00).
- (9) Disconnect support cable that connects high-pressure (HP) duct to the thrust reverser (TR) duct.
- (10) Disconnect HP duct hoop plate seal and coupling (Ref. Fig. 404), zone 435, by removing the hoop plate seal clamp and HP duct double T-bolt V-band coupling (Ref. 20-36-02).
- (11) Disconnect and cap P1 probe tube (Ref. Fig. 406).
- (12) With engine power control lever secured in fully retarded position, pull reverse thrust control lever, zone 210, toward reverse position and release to idle position.
- (13) Remove torque shaft rod (Ref. Fig. 407), zone 432, and disconnect engine interface linkage rods by removing cotter pins, nuts and bolts. Do not remove the upper bushing, lower bushing, or lockwire.

NOTE: The upper bushing is held in place by the lock-wire after the bolt has been removed and may be adjusted slightly for installation or removal of the linkage rod. The lower bushing is threaded and should not be moved.

- (14) Disconnect starter duct coupling (Ref. Fig. 404), zone 432, by removing the double T-bolt V-band coupling (Ref. 20-36-02).
- (15) Disconnect and cap IP reference pressure line, zone 432 (Ref. Fig. 406). Secure line to aircraft structure to prevent damage during engine removal and installation.

LOCKHEED
MAINTENANCE MANUAL



M1-0105-71-413

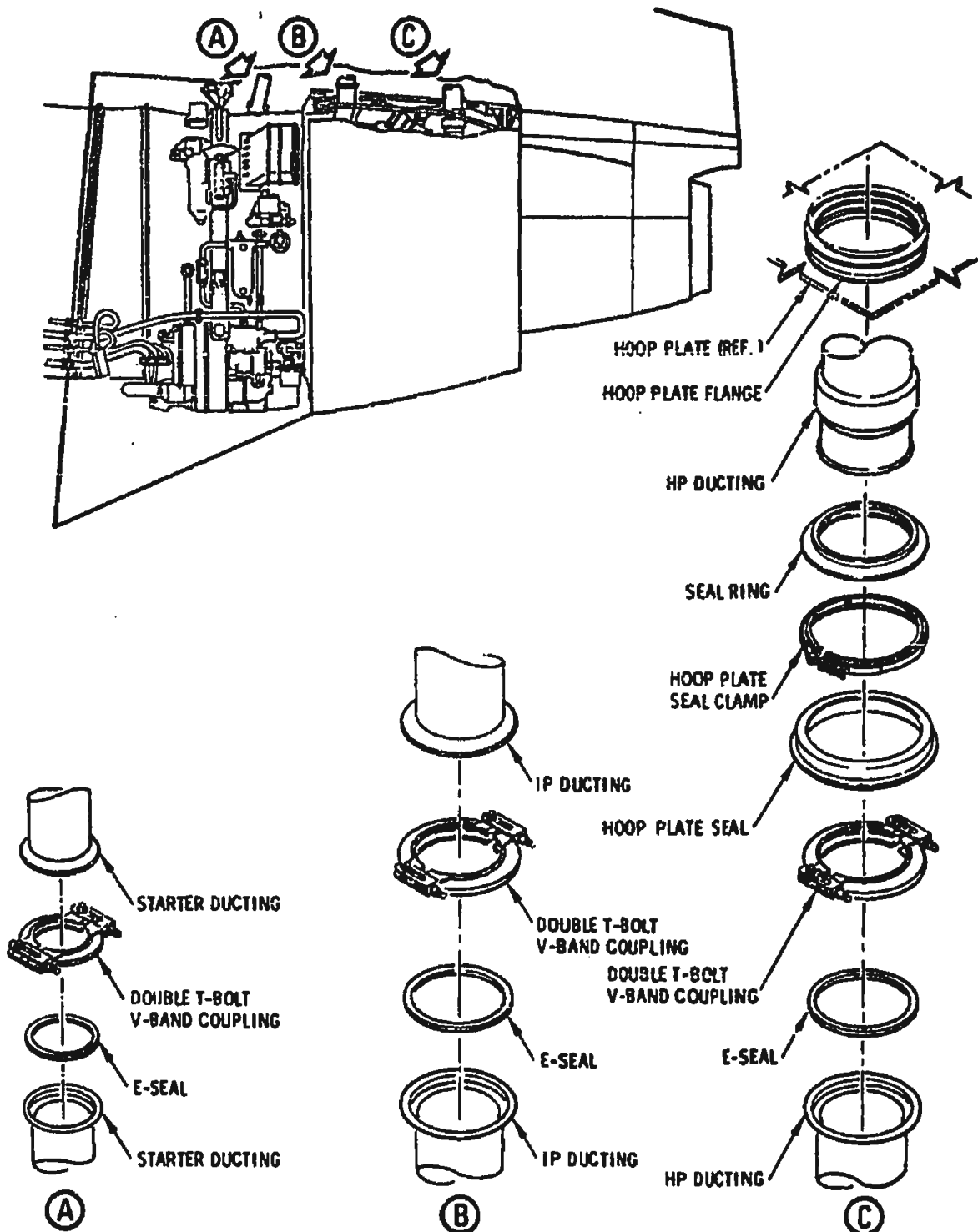
Engine No. 2 Cowl Seal Assembly
Figure 403

R
R
001B

EFFECTIVITY: ALL

71-00-03
Page 410
May 15/87

LOCKHEED
MAINTENANCE MANUAL



M1-0106-71-404

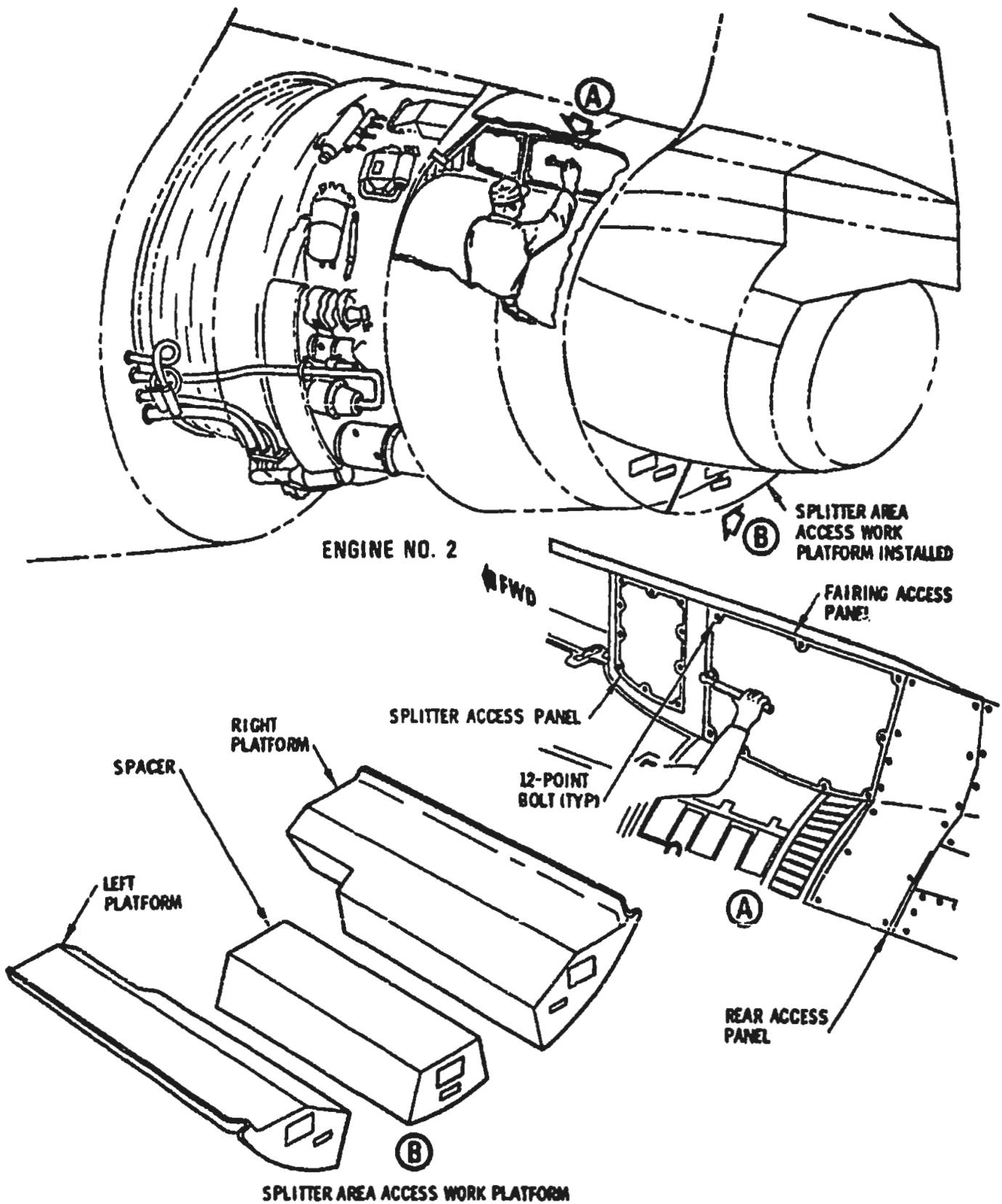
Pneumatic Disconnects
Figure 404

R
R
001B

EFFECTIVITY: ALL

71-00-03
Page 411
May 15/87

LOCKHEED
MAINTENANCE MANUAL



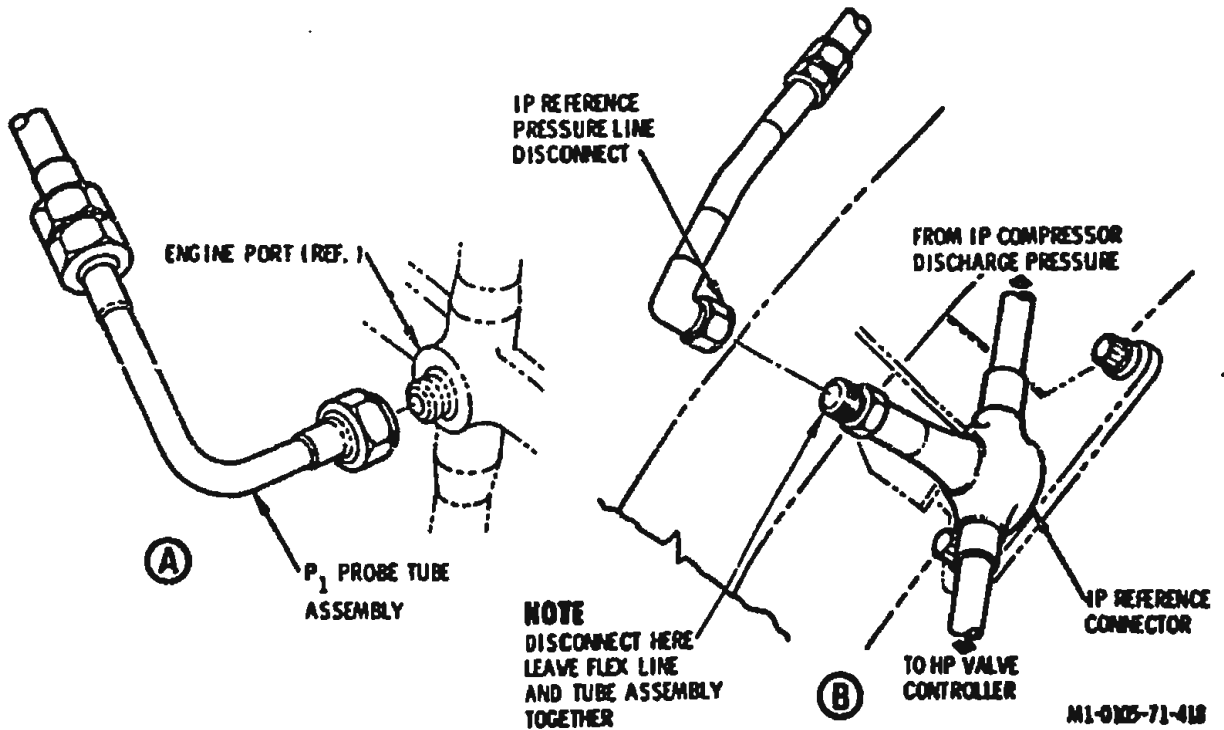
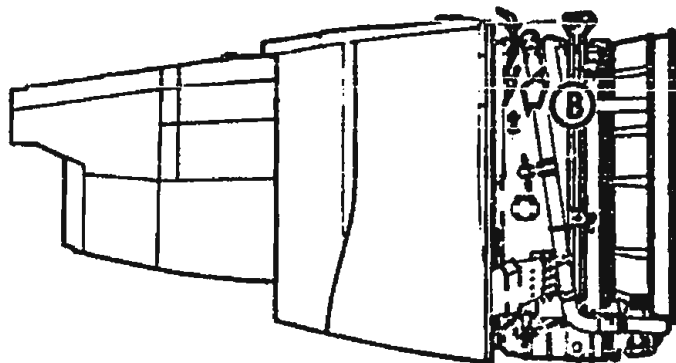
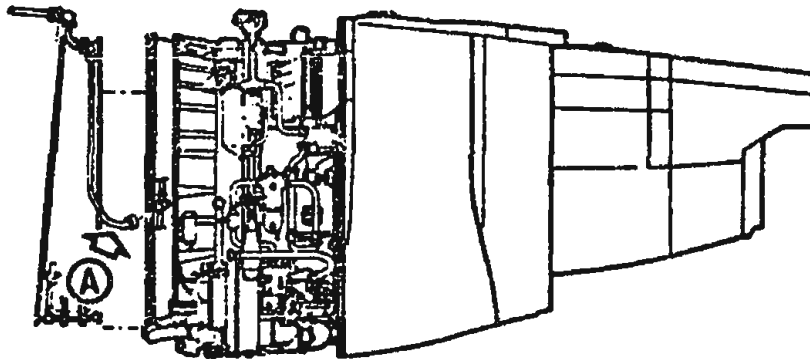
M1-0003-71-417

Splitter Area Access Work Platform
Figure 405

EFFECTIVITY: ALL

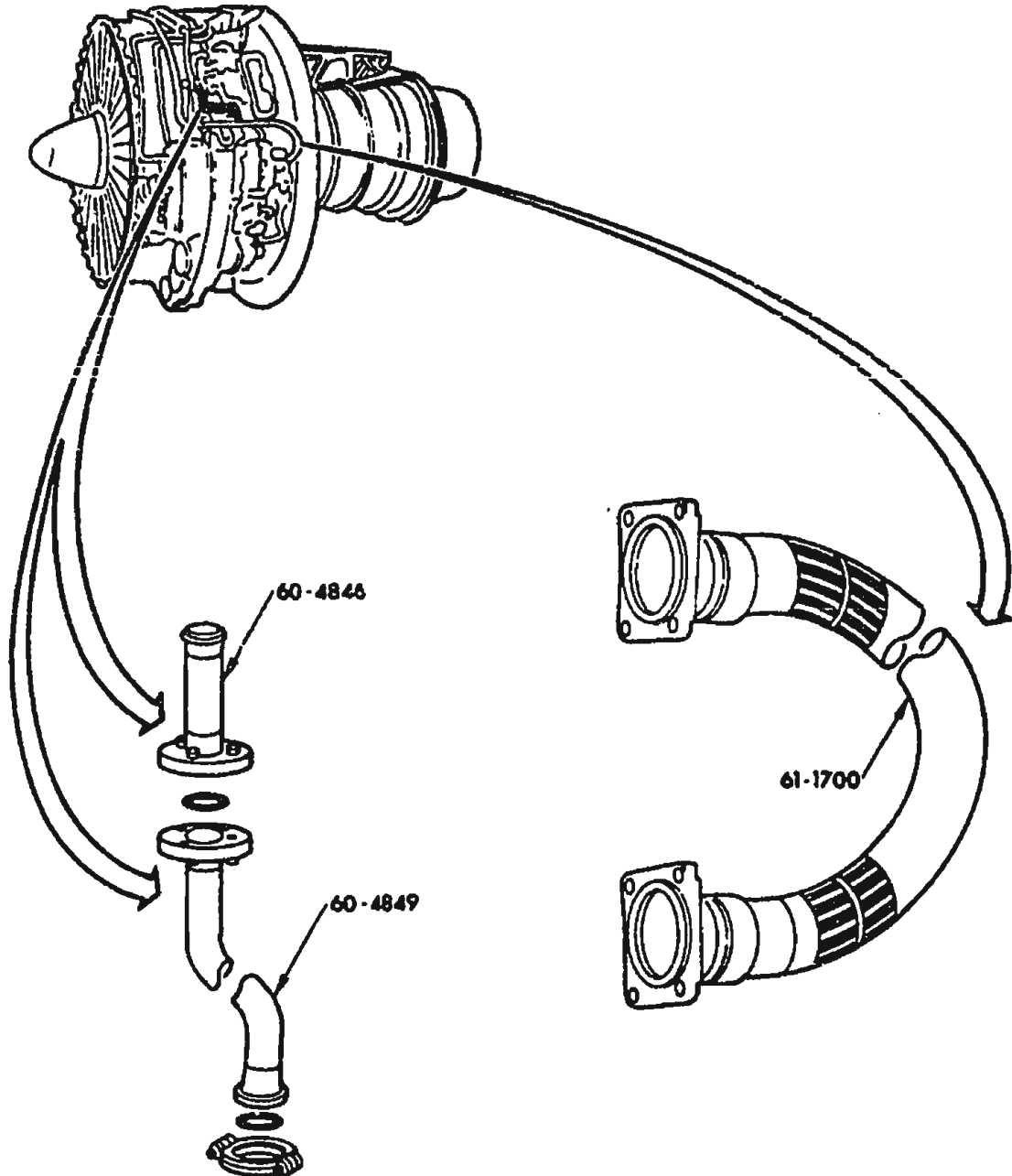
71-00-03
Page 412
Nov 15/82

LOCKHEED
MAINTENANCE MANUAL



P1 Probe and IP Reference Pressure Disconnects
Figure 406

LOCKHEED
MAINTENANCE MANUAL



MI-0000-71-079

CR
CR

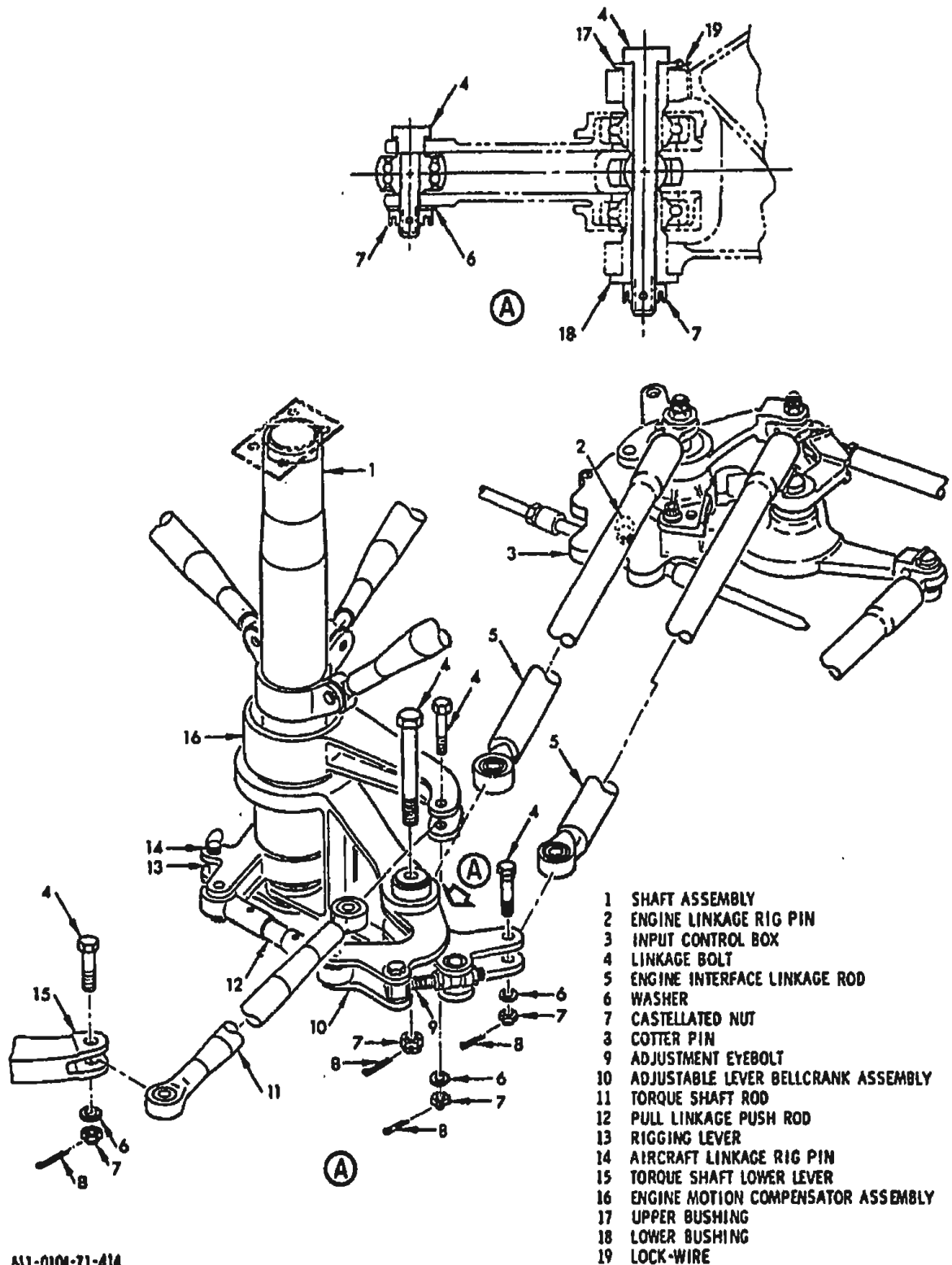
Engine Fuel Lines
Figure 406A

EFFECTIVITY: ALL

0018

71-00-03
Page 414
Nov 15/81

LOCKHEED
MAINTENANCE MANUAL



ML-0104-71-414

Throttle Control Disconnects
Figure 407

R EFFECTIVITY: ALL
R
001B

71-00-03
Page 415
Nov 15/81

LOCKHEED



MAINTENANCE MANUAL

- (16) Remove LP compressor spinner and anti-icing tube (Ref. 72-31-03). Secure spinner and tube in S-duct for temporary storage.
- (17) Attach S-duct support strap to mid fixed cowl brackets and adjust strap buckles to support S-duct (Ref. Fig. 408).
- (18) Disconnect air intake adapter from engine fan case, zone 431, and compress air intake adapter slip joint (Ref. Fig. 409).

CAUTION: USE EXTREME CARE TO PREVENT DAMAGING HYDRAULIC HOSES BY BENDING, KINKING OR TWISTING.

- (19) Disconnect hydraulic suction, pressure, and case drain pump lines (Ref. Fig. 410), zone 432. Cover disconnects with protective caps to prevent contamination.
- (20) Drain fuel from fuel supply line into container by removing drain plug (Ref. Fig. 411), zone 432. Reinstall drain plug and lock-wire.

CAUTION: WHEN THE FUEL HOSE IS DISCONNECTED IT MUST BE SUPPORTED TO ASSURE THE HOSE WILL NOT BE BENT BELOW MINIMUM BEND RADIUS OF 10.0 INCHES TO THE INSIDE SURFACE.

- (20A) Remove fuel lines (Stk Nbr 61-1700, 60-4846 and 60-4849) and stow in the box on the shipping skid.

NOTE: Assure both the lines removed and those left exposed on the engine are properly capped (Ref. Fig. 406A).

- (21) Disconnect and cap fuel line. Secure the loose end of the aft canted bulkhead fuel line in position to prevent damage to the line.
- (22) Disconnect, cap, and stow electrical QEC connectors (Ref. Fig. 412), zone 432.
- (22A) Release torque on front two bolts from forward engine mount, leave bolts snug until VP load is applied.
- (23) Install No. 2 engine bootstrap crossbeam assembly (Ref. Fig. 413) as follows:

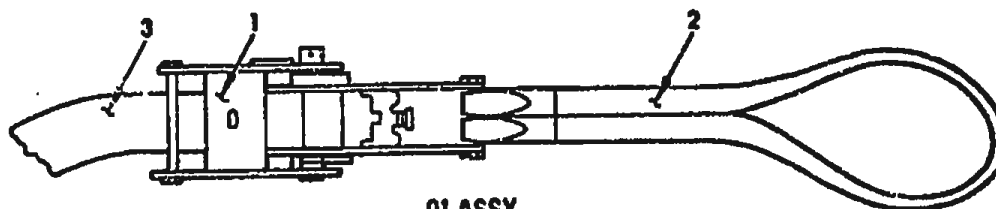
- (a) Insert the bootstrap crossbeam aft shaft through the aft bulkhead shaft housing and into the forward bulkhead bearing plate.

R EFFECTIVITY: ALL

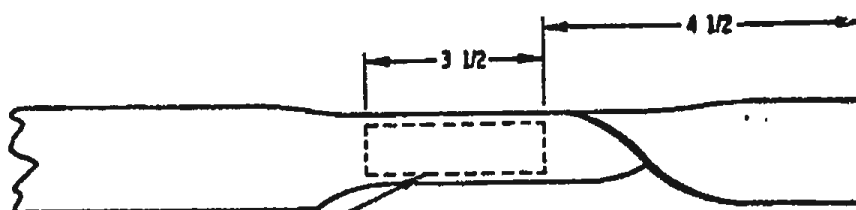
R
001B

71-00-03
Page 416
Dec 15/93

LOCKHEED
MAINTENANCE MANUAL



01-ASSY
(TYP EACH END)



SEW

STEP-1



STEP-2

MIDDLE COWL
PANEL SUPPORT
BRACKET

CENTER ENGINE
INLET ADAPTER
P/N 1507384

01 - ASSY

QUAN	PART NUMBER	NAME	MATERIAL
	01	ASSY	P/N'S 1, 2, AND 3
2	1	RATCHET	BUCKLE TIGERGRIP MODEL NO. 200 NEWCO K. C. MO
2	2	LOOP	1/8 x 2 x 5 FT NYLON WEBBING
1	3	STRAP	1/8 x 2 x 12 FT NYLON WEBBING

M1-0100-71-032

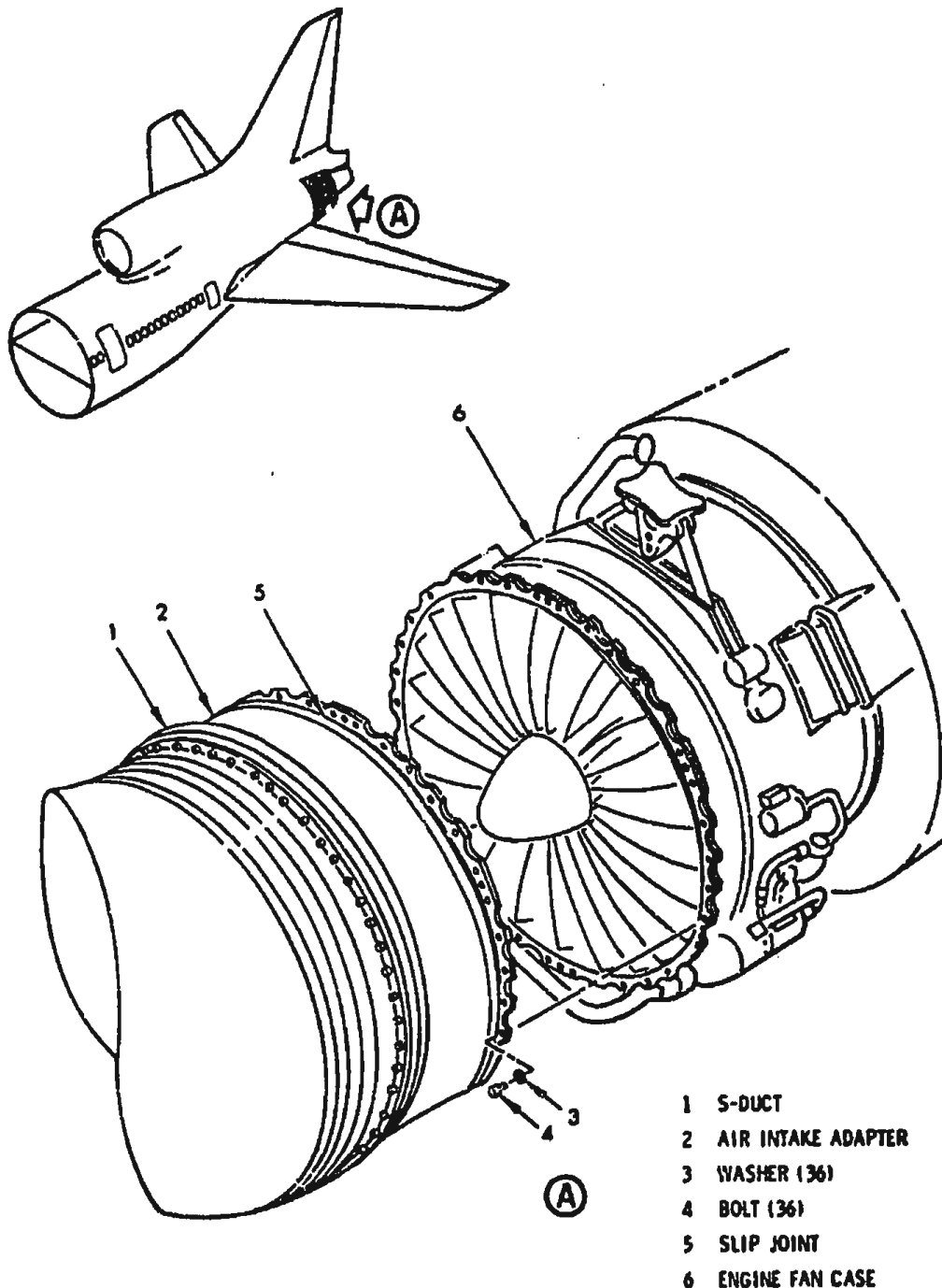
S-duct Support Strap
Figure 408

R
R
001B

EFFECTIVITY: ALL

71-00-03
Page 417
Aug 15/82

LOCKHEED
MAINTENANCE MANUAL



M1-0103-71-410

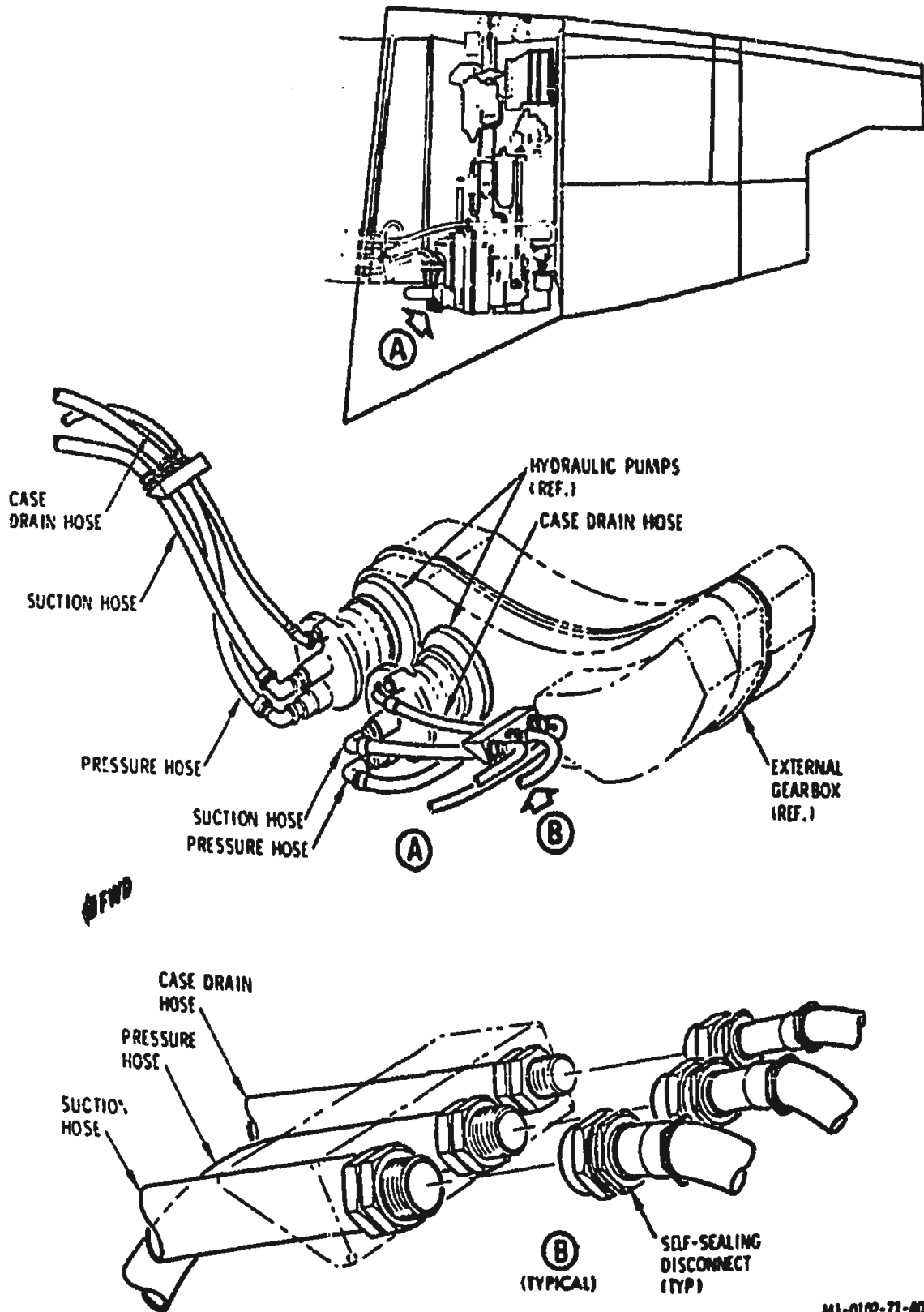
Air Intake Adapter
Figure 409

R
R
001B

EFFECTIVITY: ALL

71-00-03
Page 418
Aug 15/82

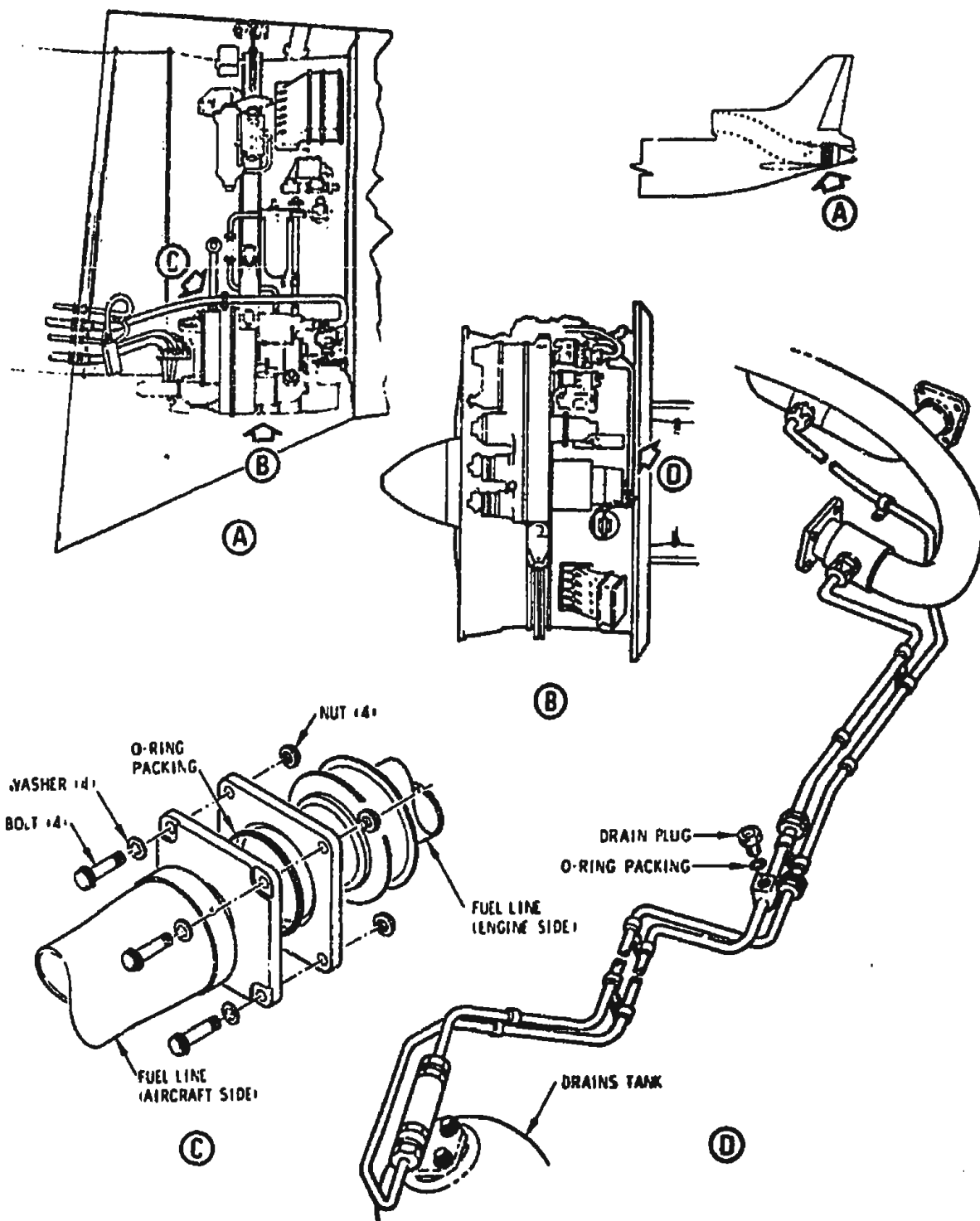
LOCKHEED
MAINTENANCE MANUAL



M1-0102-71-002

Hydraulic Disconnects
Figure 410

LOCKHEED
MAINTENANCE MANUAL

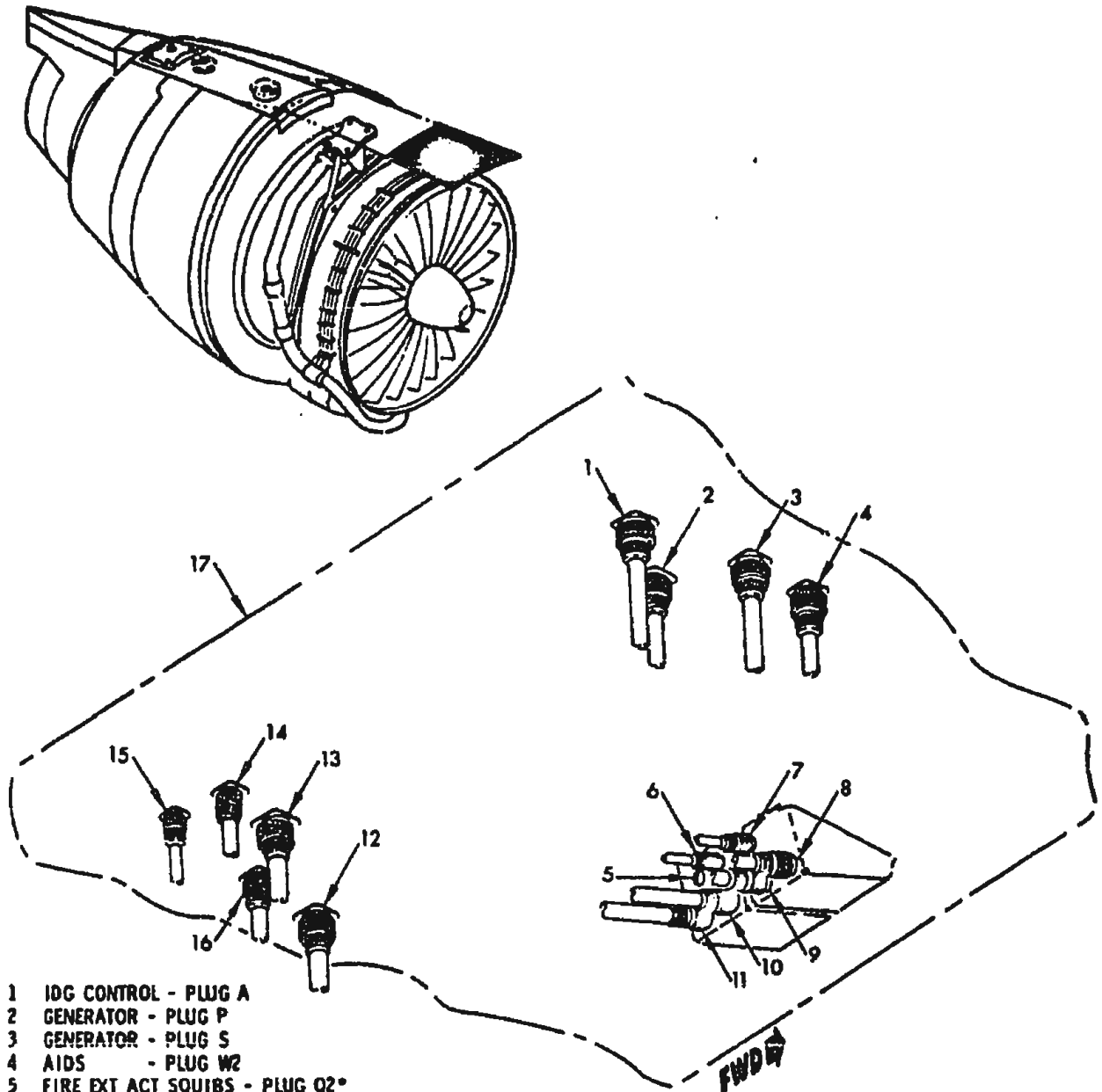


M1-0101-71-401

Fuel Line Disconnect
Figure 411

R R
0018 EFFECTIVITY: ALL

71-00-03
Page 420
Nov 15/81



- 1 IDG CONTROL - PLUG A
- 2 GENERATOR - PLUG P
- 3 GENERATOR - PLUG S
- 4 AIDS - PLUG W2
- 5 FIRE EXT ACT SQUIBS - PLUG Q2*
- 6 FIRE DET A - PLUG D2
- 7 FIRE DET B - PLUG D1
- 8 AIDS - PLUG W1
- 9 ENG GEN SVCE - PLUG H
- 10 TACH IND AND THR RVS - PLUG C1
- 11 AIDS - PLUG M
- 12 FUEL CONT AND IGN - PLUG G
- 13 ANTI-ICE START AND FUEL - PLUG E
- 14 HP AIR AND FUEL SOV - PLUG C2
- 15 VIB PICKUP - PLUG T
- 16 ESSENTIAL SVCE - PLUG Q1
- 17 SUPPORT

VIEW LOOKING UP

NOTE

* PROVISION ONLY

M1-0102-71-403

Electrical Disconnects
Figure 412

R
R
001B

EFFECTIVITY: ALL

71-00-03
Page 421
Nov 15/81



MAINTENANCE MANUAL

- (b) Install retainer pin through the shaft housing and aft shaft to secure the shaft to the bulkheads.
- (c) Place the bootstrap aft crossbeam into the aft fairing access.

NOTE: The aft crossbeam must be placed into the fairing access so that the crossbeam rotation limit pin will be on the forward left side of the beam to mate with the stop bracket.

- (d) Place the aft crossbeam on the aft shaft ensuring that the limit pin mates with the stop bracket.
- (e) Install retainer pin through the shaft to secure the aft crossbeam to the aft shaft.
- (f) Position crossbeam, in both directions, to full travel position of limit pin in stop bracket and apply tape on fuselage for visual indication of limits.

NOTE: Particular care must be taken to ensure cable loads are maintained evenly by synchronizing operation of the four hoists, and watching the aft crossbeam to keep it level. Strips of tape across the access opening above and below the aft crossbeam will provide good visual reference.

If sheared fasteners should occur at the housing attachment to F.S. 2151 bulkhead, install NAS 1103 or equivalent strength bolts in all locations. This will require reaming ten rivet holes to .1915 diameter. Advise engineering of details.

- (g) Attach the dynamometers and manual chain hoists to the aft crossbeam.
- (h) Attach the bootstrap crossbeam center beam assembly to the center engine support structure forward mount fittings with retainer pins.
- (i) Attach the outer beams to the center beam with retainer pins.
- (j) Attach the dynamometers and manual chain hoists to the outer beams.



MAINTENANCE MANUAL

NOTE: A preliminary check of the front bootstrap beam is accomplished by attaching the beam to the forward mount fitting, observing vertical attitude, exchanging beam ends one side to the other, reversing center section, and observing beam at each step to determine maximum clearance of beam to mount. Mark beam segments with proper orientation to facilitate assembly at subsequent engine changes.

- (24) Position engine transportation base and multipurpose stand (Ref. Fig. 414) for receiving QEC unit.
- (25) Attach trunnion fittings to engine, zone 432, as follows:
- (a) Remove spherical bearings from engine stand forward supports, insert bearings into engine receptacle, and index for receiving trunnion bolts (Ref. Fig. 414).

NOTE: Ensure that spherical bearing is free of burrs and nicks before inserting bearing into receptacle fitting.

- (b) Remove forward supports from engine stand and attach to spherical bearings in engine receptacle fittings.
- (c) Remove aft supports from engine stand and attach to engine with pins that secure links to bosses of handling plates.
- (26) Attach hoist cables and dynamometers to multipurpose stand and disengage stand from transportation base.

CAUTION: ENGINE TO STAND CLEARANCE IS EXTREMELY TIGHT. CLOSE ALIGNMENT MUST BE MAINTAINED DURING ALL OPERATIONS. DO NOT EXCEED TRAVEL LIMITS, UNDER LOAD, OF CROSSBEAM ROTATION LIMIT PIN.

- (27) Actuate the manual chain hoists to remove slack from chains and hoist multipurpose stand into approximate position for attachment to QEC unit. Attach supports and pickup arms to multipurpose stand.

CAUTION: DO NOT EXCEED LOAD OF 7000 LB ON A SINGLE FORWARD HOIST OR 4500 LB ON A SINGLE REAR HOIST. MAINTAIN EQUAL LOADS SIDE TO SIDE WITHIN ± 1000 LB BETWEEN THE FRONT DYNAMOMETERS AND BETWEEN THE REAR DYNAMOMETERS.

R EFFECTIVITY: ALL

R

001B

71-00-03

Page 423

Dec 15/93



- (28) Preload dynamometers to ensure that hoists accept weight of engine and multipurpose stand as follows:
- (a) Determine weight of engine multipurpose stand.
 - (b) Add No. 2 engine weight of 12,580 lbs, weight of multipurpose stand, and 1000 lbs preload for a total load.
 - (c) Distribute the load approximately as follows:
 - 70 percent equally divided between two forward hoists
 - 30 percent equally divided between two rear hoists

WARNING: ONLY THE 2 FORWARD BOLTS ON FRONT ENGINE MOUNT MAY BE LOOSENED BEFORE TAKING UP THE ENGINE WEIGHT WITH THE HOISTING EQUIPMENT.

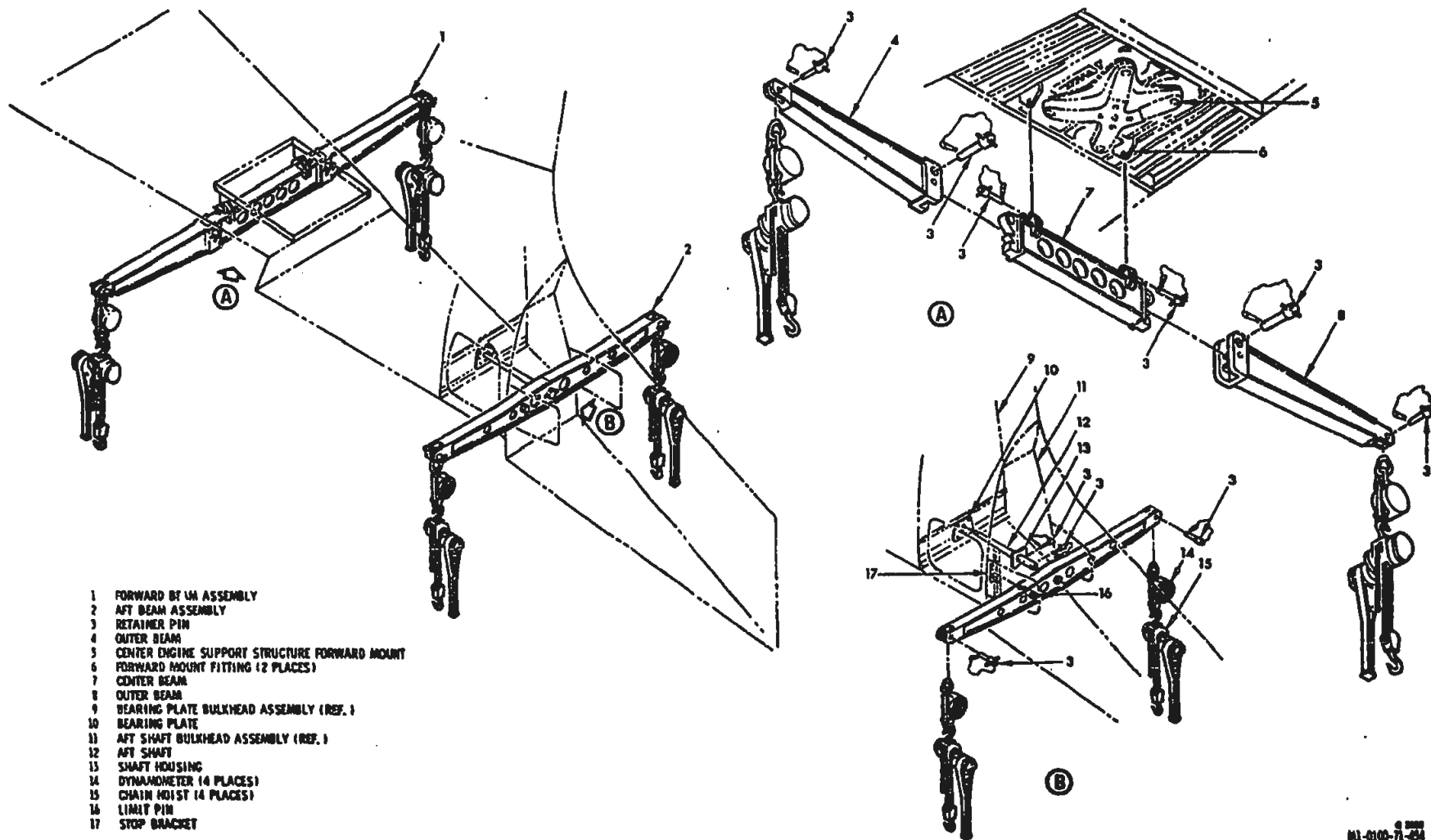
- (29) Remove front and rear engine mount bolts (Ref. Fig. 415 and 416), zone 471.

NOTE: Tool GL-72-HA-1 (Ratchet Adapter) may be used to place a socket on the bolt head. If thread damage is evident on mount bolts, inspect nuts for thread wear or damage.

- (30) Lower QEC unit and multipurpose stand (Ref. Fig. 414) slowly, guiding them free of all interfaces.
- (31) Secure multipurpose stand to transportation base by properly positioning and tightening swing bolts.
- (32) Inspect exposed surfaces of V-flange seals (E-seals) in flanges of IP, HP, starter (Ref. Fig. 404), gearbox breather, and fuel drain tank vent ducts for deformation, nicks, dents, or tears. Remove and replace damaged seals.

NOTE: E-seals are manufactured slightly out-of-round for secure fit in male portion of ducting joints. Most common defects will be nicks, dents, cuts, or deformation from flat plane. Do not remove any seals for inspection if they appear to be in satisfactory condition.

- (33) Place dust covers over QEC unit and related aircraft exposed ducts.



M1-0100-71-284

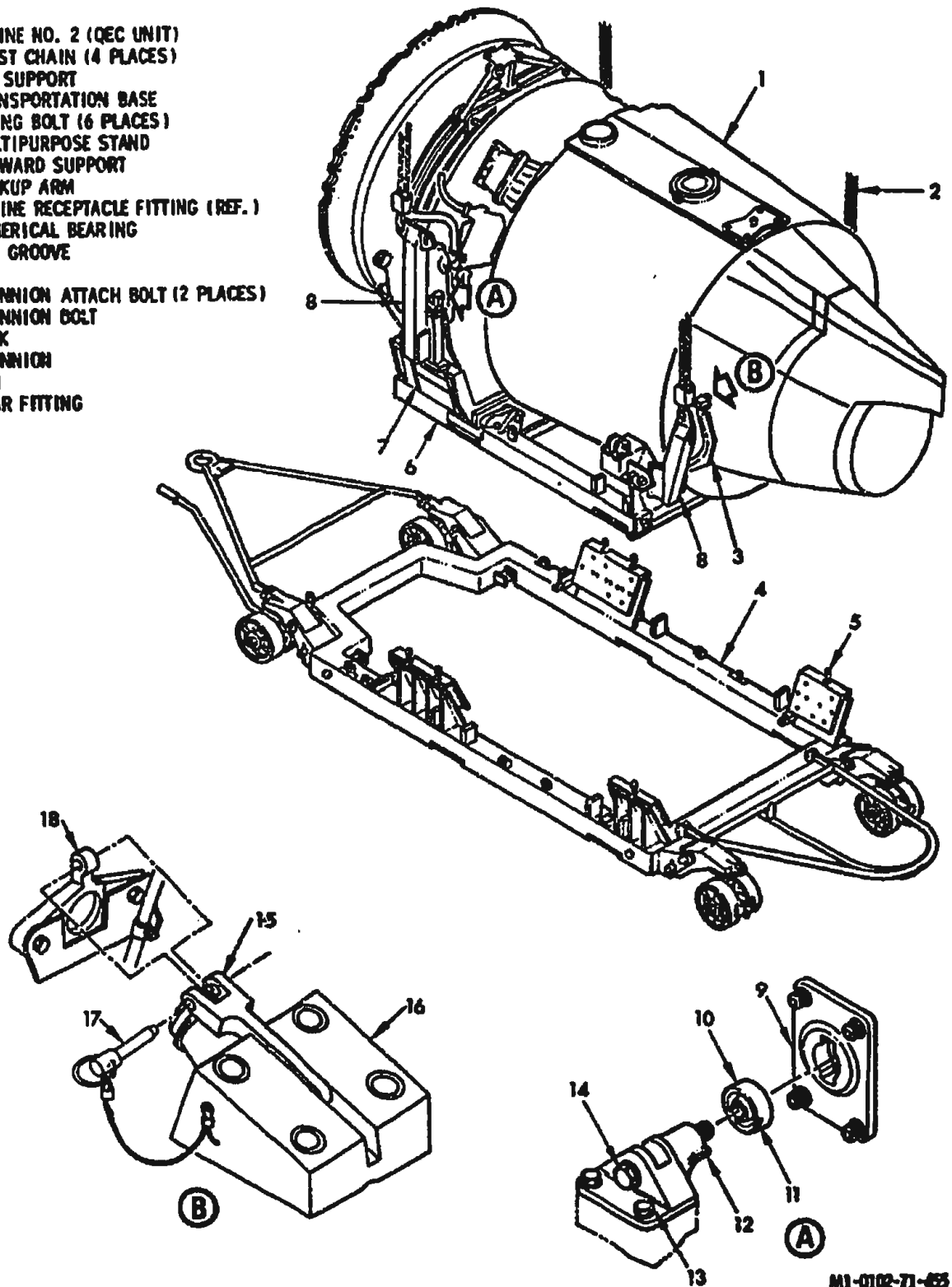
No. 2 Engine Bootstrap Crossbeam Assembly
Figure 413

71-00-03
Page 425/426
Nov 15/83

R EFFECTIVITY: ALL
R
001B

LOCKHEED
MAINTENANCE MANUAL

- 1 ENGINE NO. 2 (DEC UNIT)
- 2 HOIST CHAIN (4 PLACES)
- 3 AFT SUPPORT
- 4 TRANSPORTATION BASE
- 5 SWING BOLT (6 PLACES)
- 6 MULTIPURPOSE STAND
- 7 FORWARD SUPPORT
- 8 PICKUP ARM
- 9 ENGINE RECEPTACLE FITTING (REF.)
- 10 SPHERICAL BEARING
- 11 KEY GROOVE
- 12 KEY
- 13 TRUNNION ATTACH BOLT (2 PLACES)
- 14 TRUNNION BOLT
- 15 LINK
- 16 TRUNNION
- 17 PIN
- 18 REAR FITTING



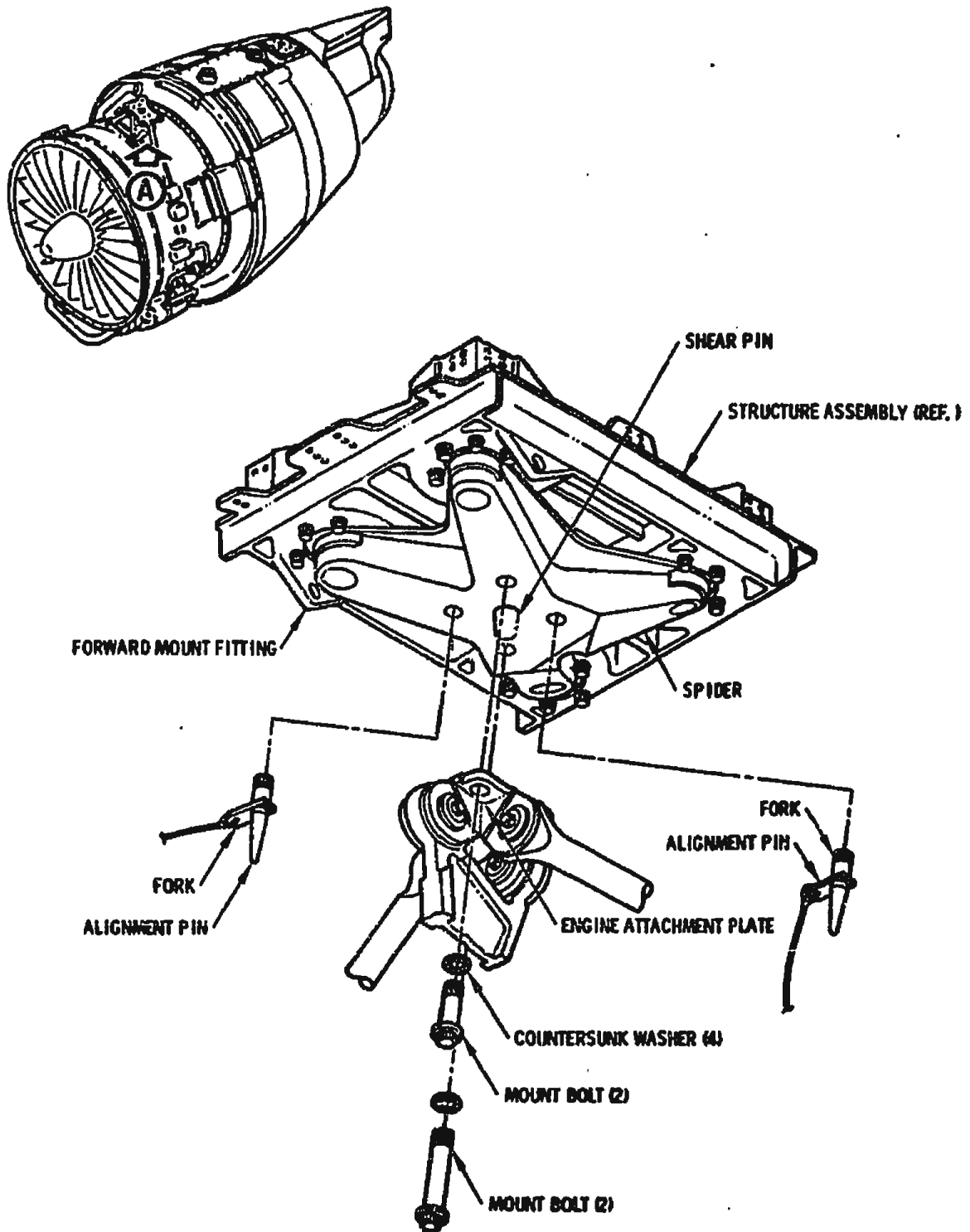
M1-0102-71-455

Multipurpose Stand
Figure 414

R EFFECTIVITY: ALL.
R
001B

71-00-03
Page 427
Nov 15/83

LOCKHEED
MAINTENANCE MANUAL



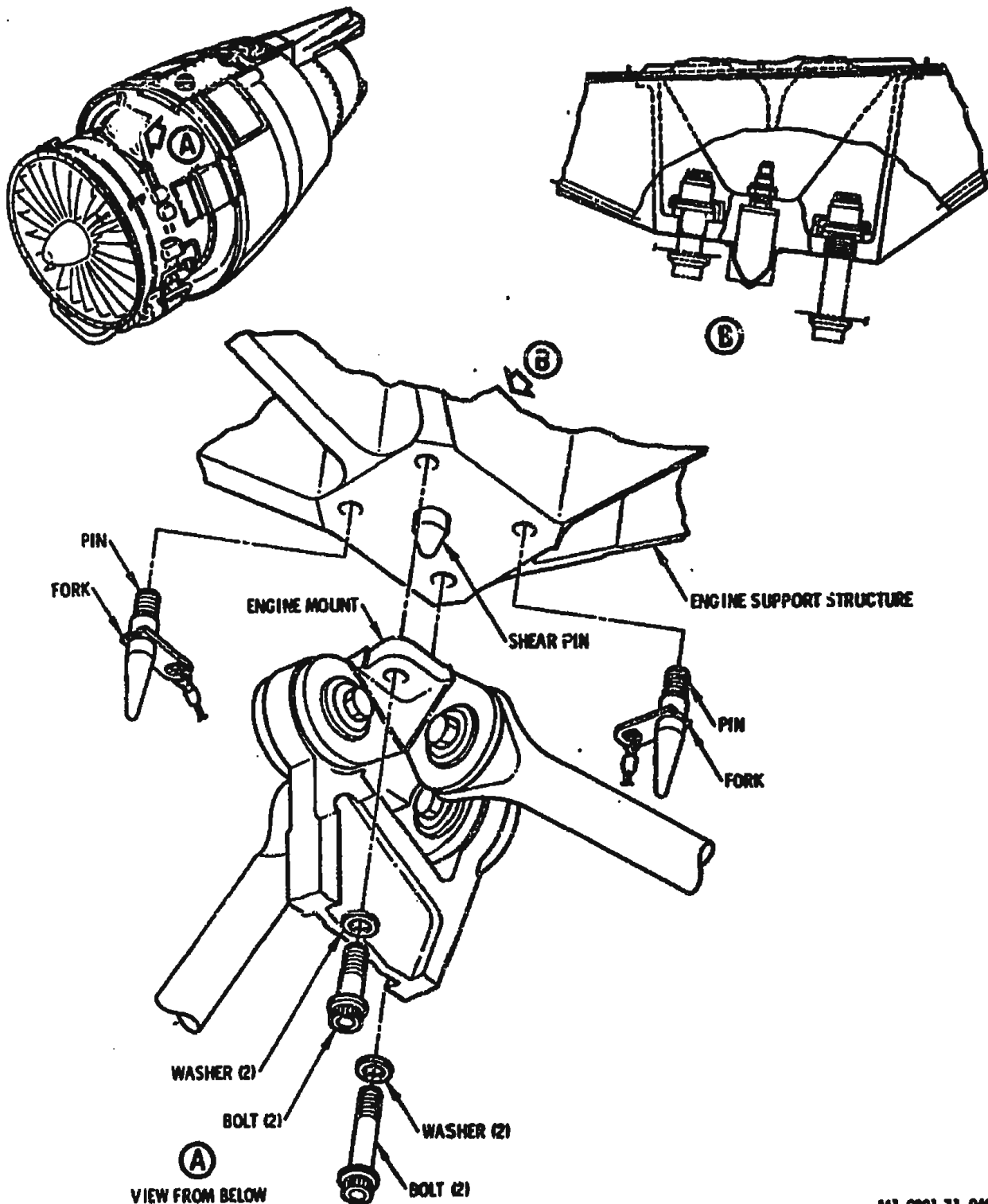
M1-0002-71-457

Front Engine Mount
Figure 415

R EFFECTIVITY: AIRCRAFT 001-014
R
001B

71-00-03
Page 428
Nov 15/81

LOCKHEED
MAINTENANCE MANUAL



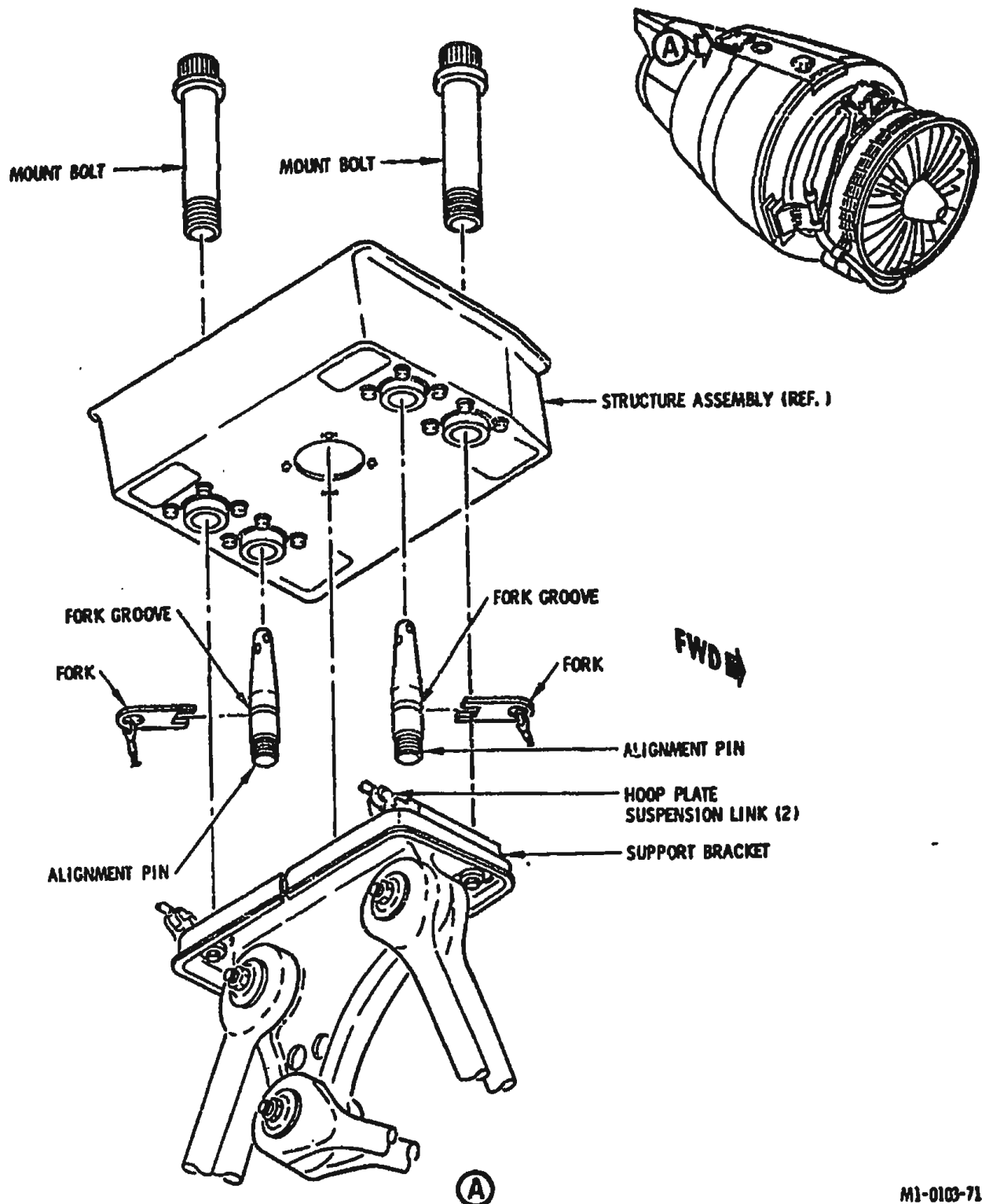
M1-0001-71-040

Front Engine Mount
Figure 415

R EFFECTIVITY: AIRCRAFT 015-999
R
001B

71-00-03
Page 429
Nov 15/81

LOCKHEED
MAINTENANCE MANUAL



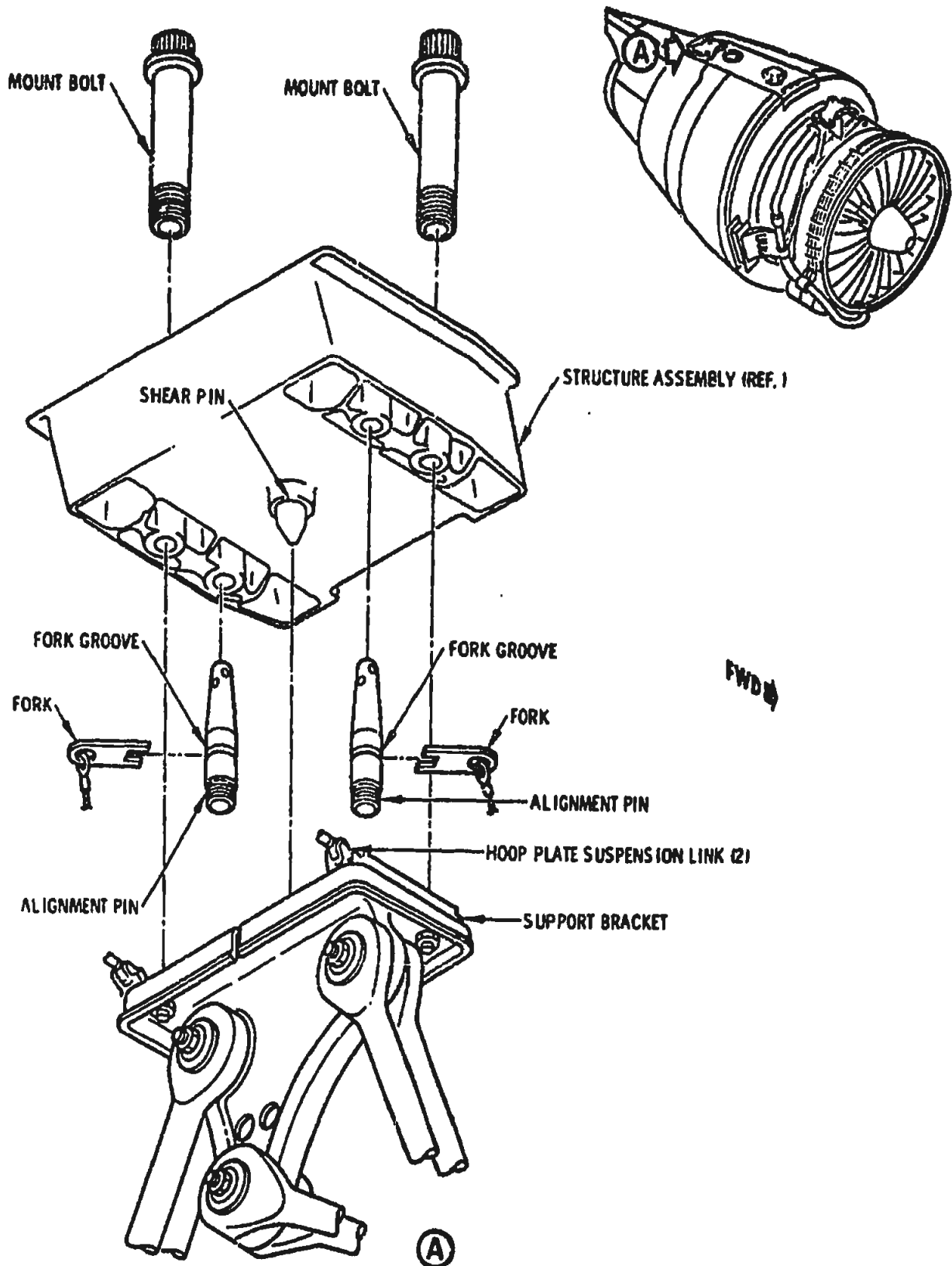
M1-0103-71-458

Rear Engine Mount
Figure 416

R
R
001B EFFECTIVITY: AIRCRAFT 001-007

71-00-03
Page 430
Nov 15/89

LOCKHEED
MAINTENANCE MANUAL



M1-0001-71-041

Rear Engine Mount
Figure 416

71-00-03
Page 431
Nov 15/89

EFFECTIVITY: AIRCRAFT 008-999

R
R
001B



- (34) Disconnect hoist chain from multipurpose stand and remove splitter access platform from cold-stream collector.
- (35) Move transportation base to clear area for replacement of QEC unit.

B. Installation (Bootstrap)

- (1) Verify that aircraft is in configuration as established for removal Step 3A (1).

NOTE: The thrust reverser airmotor oil reservoir can be filled and the level checked while the engine is installed on the multi-purpose stand by using the No. 2 engine position full mark on the airmotor oil dipstick. This oil level will then be correct when the engine is installed in any of the three positions on the aircraft.

CAUTION: ENGINE MOUNT BOLTS, NUTS, AND MOUNT BOLT HOLES MUST BE INSPECTED EACH INSTALLATION FOR SCORES, BURRS, AND ABRASIONS.

PRIOR TO AND DURING ENGINE INSTALLATION, CHECK THAT ENGINE FRONT AND REAR MOUNTS UPPER AND LOWER SURFACES, BOLT HOLES AND SHEAR PIN BLIND HOLES (THESE LOCATE WITH AIRFRAME MOUNTED SHEAR PINS) ARE FREE FROM DAMAGE, OIL, GREASE OR ANY OTHER FOREIGN MATERIAL. USING SOLVENT, WIPE CLEAN AS NECESSARY.

- (2) Inspect engine mount bolts and mount bolt holes each installation. Inspect nuts for cracks, thread wear or damage, and loose fit. Noticeable distortion or scratches deep enough to reduce efficiency of the threads is cause for rejection. The threads must remain in a serviceable condition and permit free installation with the fingers up to the self locking element. Reject bolts and nuts having stripped or cross threaded threads. If bolt/nut combinations, lubricated with MIL-T-5544, do not have a back-off breakaway torque of at least 70 pound-inches (back-off breakaway torque refers to minimum torque required after initial unseating) or if the free running torque while tightening is more than 800 pound-inches, reject the used nut. If same torque requirements cannot be met with a new nut, reject the bolt. Burrs, abrasions, or score marks must be fingernail smooth (Ref. Table 401 and Fig. 420) with the following limitations. [Bushings requiring rework beyond maximum limits must be replaced (Ref. 54-11-01)]:

R

EFFECTIVITY: ALL

71-00-03

Page 432
May 15/90

LOCKHEED



MAINTENANCE MANUAL

- (a) Rework is not permitted on the bolt shank within 0.3 inch of the bolt head.

NOTE: Limit does not apply to Vibratory Rework Method.

- (b) Rework must be held to a minimum, with a smooth transition from the normal diameter to the rework diameter.
- (c) The root radius of any score or scratch must be smoothed to 0.090 inch.
- (d) Machine-powered grinding is not permitted on bolts or bushings.
- (e) Rework bolthead flat surface to a maximum depth of .003 inches. Rework to be done by hand.

LOCKHEED



MAINTENANCE MANUAL

Engine Mount Bolt and Mount Bolt Hole Rework
Table 401

PART NUMBER	DESCRIPTION	DIAMETER AFTER REWORK
VEP 220555-16	Bolt	.9880 min
1561770-101	Bushing	1.050 max
FORWARD MOUNT:		
1569978-101	Bushing	1.050 max
1569978-103	Bushing	1.050 max
1569978-105	Bushing	1.050 max
1569978-107	Bushing	1.050 max
PREFERRED SPARES:		
1569978-109	Bushing	1.050 max
1569978-111	Bushing	1.050 max
AFT MOUNT:		
1562129-103	Bushing	1.010 max
1562129-105	Bushing	1.050 max
PREFERRED SPARES:		
1562129-107	Bushing	1.050 max

R
R
0018

EFFECTIVITY: ALL

71-00-03
Page 434
Aug 15/82



MAINTENANCE MANUAL

NOTE: If hand reworking is impractical, see Structural Repair Manual 54-00-00 for alternate method.

R

CAUTION: THE FORK MUST BE INSTALLED IN ALIGNMENT PIN GROOVE PRIOR TO SECURING PIN IN MOUNT TO CONTROL PIN PENETRATION AND PREVENT DAMAGE TO MOUNT BOLT NUT.

- (3) Install alignment pins in aircraft side of engine front mount (Ref. Fig. 415, 416 and 417); thread alignment pins into engine side of rear mount (one pin in forward hold and one in diametrically opposite rear hole of each mount).
- (4) Attach cowl seal assembly (Ref. Fig. 403) to replacement engine. Pull seal assembly rub strips and seal aft over thrust reverser firewall for stowage.
- (5) Ensure that V-flange seals (E-seals) are installed properly in the IP, HP, starter ducting, and in gearbox breather duct. Ensure that hoop plate suspension links are disconnected from support bracket (Ref. Fig. 416).
- (6) Install aircraft linkage rig pin (Ref. Fig. 407), zone 451 or 561.

NOTE: With engine power control lever secured in fully retarded position, it may be necessary to pull reverse thrust control lever, zone 210, toward reverse position and to release it in the idle position to align rig pin holes.

- (7) Lubricate QEC unit mount bolts under bolt head, on shank, and on threads with MIL-T-5544 or equivalent lubricant.

CAUTION: WHEN INSTALLING A REVERSER, WHETHER BY ITSELF OR AS PART OF A REPLACEMENT ENGINE, ALWAYS CONFIRM THE CASCADE CONFIGURATION AGAINST MAINTENANCE MANUAL CHART AND MAKE CERTAIN IT IS CONFIGURED FOR THE ENGINE POSITION FOR WHICH IT IS TO BE INSTALLED (Ref 78-31-20).

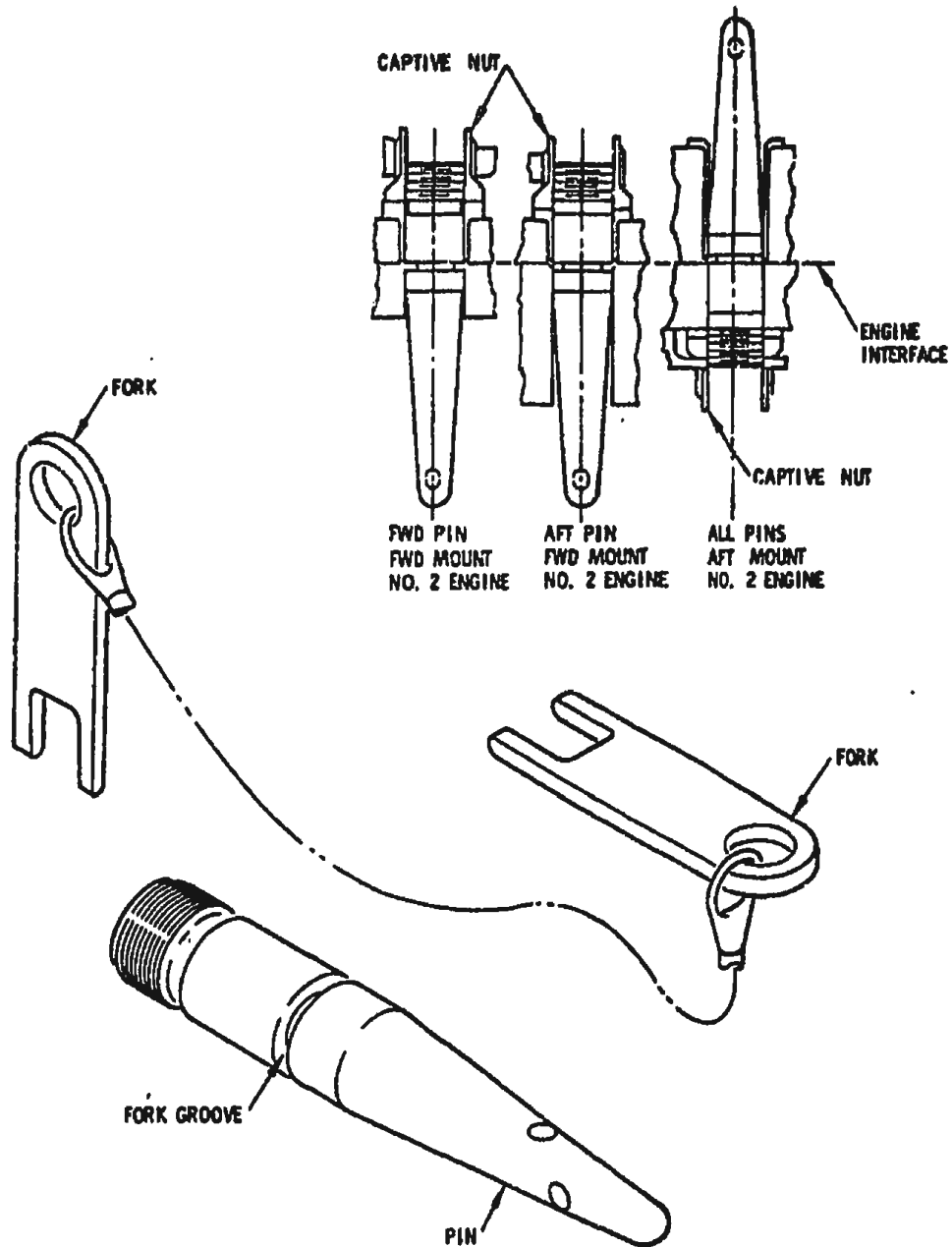
- (8) Place the replacement QEC unit in position under the aircraft in preparation for installation.
- (9) Ensure splitter area access work platform has been installed.
- (10) Attach hoist chains to multipurpose stand pickup arms (Ref. Fig. 414). Detach swing bolts to free stand from transportation base.

EFFECTIVITY: ALL

001B

71-00-03
Page 435
May 15/85

LOCKHEED
MAINTENANCE MANUAL



M1-0103-71-415

Alignment Pins
Figure 417

R
R
001B | EFFECTIVITY: ALL

71-00-03
Page 436
Aug 15/82



(11) Actuate manual chain hoists to remove slack from cables until each dynamometer indicates approximately 1000 pounds.

(12) Remove protective covers and caps from ducts and openings.

CAUTION: THE ENGINE MOUNT SHEAR PIN MUST BE SECURED IN THE SUPPORT STRUCTURE FRONT ENGINE MOUNT SPIDER PRIOR TO ENGINE INSTALLATION.

(13) On aircraft 001-014,
verify that shear pin is secured in support structure front engine mount.

CAUTION: THE FRONT AND REAR ENGINE MOUNT SHEAR PINS MUST BE SECURED IN SUPPORT STRUCTURE ENGINE MOUNTS PRIOR TO ENGINE INSTALLATION.

(13) On aircraft 015-999,
verify that shear pins are secured in support structure front and rear engine mounts.

CAUTION: DO NOT EXCEED TRAVEL LIMITS, UNDER LOAD, OF CROSSBEAM ROTATION LIMIT PIN.

(14) Raise QEC unit to preinstallation position (within approximately 4 inches) of mounts.

NOTE: During all phases of mating the QEC unit to the fuselage, monitor all interfaces for proper clearance.

(15) Hoist QEC unit slowly to within approximately three-sixteenths inch of front and rear mounts while directing alignment pins into proper mounting holes (Ref. Fig. 415 and 416). Check engine and air intake adapter alignment.

CAUTION: WASHERS MUST BE INSTALLED WITH COUNTERSINK TOWARD BOLT HEAD.

DO NOT ALLOW ENGINE WEIGHT TO BE TAKEN UP BY BOLTS.

(16) Install forward mount bolts and washers (countersink toward head of bolts) and rear mount bolts in holes that do not contain alignment pins. Remove alignment pins from both mounts and install remaining mount bolts and washers. The bolts should be finger tight.

LOCKHEED
MAINTENANCE MANUAL

CAUTION: DO NOT EXCEED LOAD OF 7000 LB ON A SINGLE FORWARD HOIST OR 4500 LB ON A SINGLE REAR HOIST. MAINTAIN EQUAL LOADS SIDE-TO-SIDE WITHIN ± 1000 LB BETWEEN THE FRONT DYNAMOMETERS AND BETWEEN THE REAR DYNAMOMETERS.

- (17) Raise QEC unit to engage front and rear mounts. Apply an upward load (preload, in addition to engine and stand weight) of approximately 500 lbs on each mount pad (250 lbs per dynamometer).

NOTE: Verify that bolt threads and self-locking feature have been checked as required in Step B(2).

- (18) Torque all mount bolts to 700 (± 50) lb ft. The bolts at each mount pad are to be torqued first across the diagonals, then in sequence around the bolt pattern so that each bolt is torqued twice.

NOTE: If access to the bolts is difficult, tool No. GL-72-HA-1 (Ratchet Adapter) may be used as per Fig. 418, paying close attention to the torque application chart.

In the event engine mount bolts are incorrectly torqued, assuming they have not been torqued to more than 950 lb ft, retorquing can be accomplished as follows:

- (a) Loosen each mount bolt, following the torque pattern, and retorque before loosening next bolt.
- (b) Removal of any bolt for inspection can be accomplished during the sequence.

- R
- (19) Lubricate air intake adapter to engine fan case bolts under bolt heads, on shanks and on threads with MIL-T-5544 or equivalent lubricant.
- (20) Install and tighten air intake adapter to engine fan case bolts to a torque value of 225 to 277 lb in. (Ref. Fig. 409). Remove S-duct support strap.
- (21) Decrease load until dynamometers indicate approximately weight of multipurpose stand and detach trunnion bolts, trunnions, and supports (Ref. Fig. 414) from QEC unit, zone 433.
- (22) Lower stand and secure to transportation base.

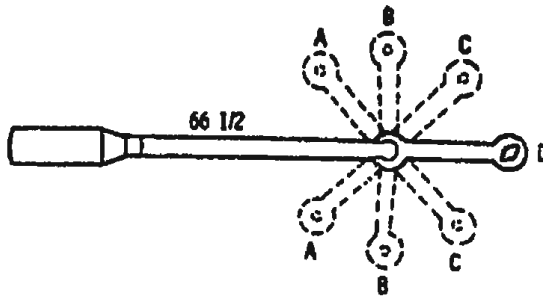
EFFECTIVITY: ALL

71-00-03
Page 438
Jun 15/93

001B

LOCKHEED
MAINTENANCE MANUAL

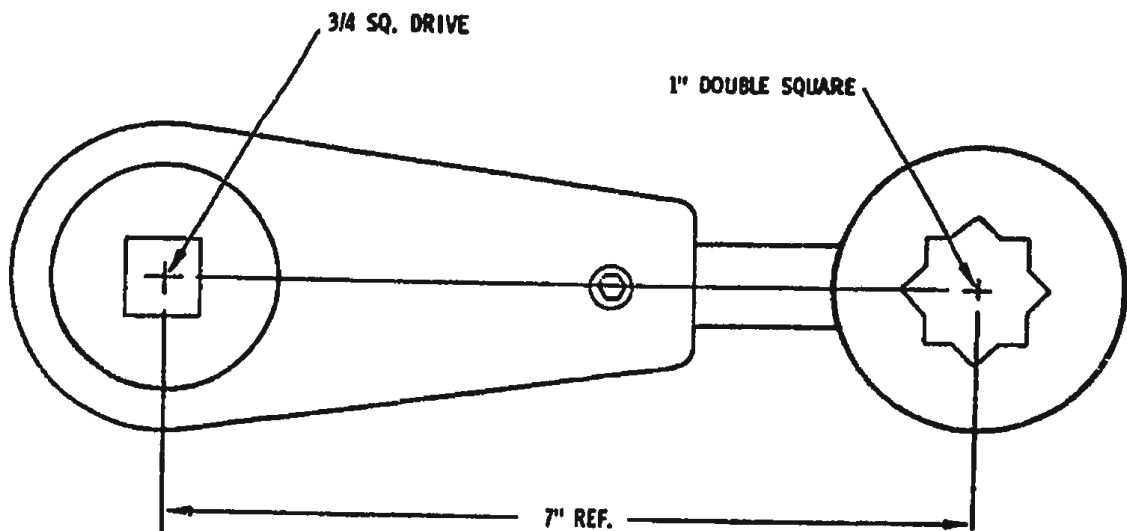
TORQUE WRENCH EXTENSIONS USE



TORQUE APPLICATION CHART
USING EXTENSION INDICATED.

POSITION	INDICATED TORQUE
A	744.5 (± 52.5)
B	700 (± 50)
C	665 (± 47.5)
D	616 (± 44)

NOTE: THIS CHART IS FOR USE
WITH RATCHET ADAPTER, TOOL
#GL-72-HA-1 AND A 66 1/2
TORQUE WRENCH.



M1-0000-71-001

Torque Application Chart for Ratchet Adapter
Figure 418

R
R
001B

EFFECTIVITY: ALL

71-00-03
Page 439
Aug 15/82



MAINTENANCE MANUAL

- (23) Remove spherical bearings from QEC unit hoist points. Stow bolts and fittings on multipurpose stand.
- (24) Detach hoist chains from multipurpose stand, run chains to fully up position, and move transportation base clear of area.
- (25) Remove No. 2 engine bootstrap crossbeam assembly (Ref. Fig. 413) as follows:
 - (a) Remove dynamometers and manual chain hoists from the outer beams.
 - (b) Remove dynamometers and manual chain hoists from the aft crossbeam.
 - (c) Detach and remove outer beam assemblies from the center beam assembly.
 - (d) Detach and remove center beam from the center engine support structure forward mount fittings.
 - (e) Detach retainer pin and remove aft crossbeam from the aft shaft and aft fairing.
 - (f) Detach retainer pin and remove aft shaft from the bulkheads and aft fairing.
 - (g) Remove limit pin visual indication tape that was applied to fuselage during engine removal.

CR

(25A) Deleted

- (26) Connect HP duct seal and coupling (Ref. Fig. 404), zone 435. Secure with hoop plate seal clamp and HP duct double T-bolt V-band coupling (Ref. 20-36-02).

NOTE: It may be necessary to use a wood or micarta block approximately 30 inches long, 3-3/4 inches high, and 1-3/4 inches wide to assist in connecting HP duct.

- (27) Install interservices fairing LH and RH access panels, and LH and RH rear access panels (Ref. 72-03-00).
- (28) Remove splitter area access work platform.
- (29) Install LP compressor spinner and anti-icing tube (Ref. 72-31-03).

EFFECTIVITY: ALL

001B

71-00-03
Page 440
May 15/87



MAINTENANCE MANUAL

- (30) Connect IP duct coupling (Ref. Fig. 404), zone 432, and secure with double T-bolt V-band couplings (Ref. 20-36-02).

CAUTION: THE STARTER DUCT DOUBLE T-BOLT V-BAND COUPLING, MID-WAY BETWEEN THE STARTER AND START VALVE, SHOULD BE INSTALLED WITH ITS BOLTS IN A VERTICAL POSITION TO PREVENT CONTACT WITH THE S-DUCT ADAPTER AFT RING.

- (31) Verify that starter duct V-band coupling, mid-way between the starter and start valve, is installed with its bolts in a vertical position. Connect starter duct coupling (Ref. Fig. 404) and secure with double T-bolt V-band couplings (Ref. 20-36-02).

- R (32) Release IP reference pressure line from stowed position and secure to engine connection (Ref. Fig. 406).

- (33) Install torque shaft rod (Ref. Fig. 407), zone 432, and connect engine (throttle) interface linkage rods. Remove and stow rig pins.

- (34) Ensure that hoop plate suspension links are connected (Ref. Fig. 416).

CAUTION: USE EXTREME CARE TO PREVENT DAMAGING HYDRAULIC HOSES BY BENDING, KINKING OR TWISTING. PREVENT INTRODUCTION OF TWISTING PRELOAD IN HOSES WHEN TIGHTENING FITTINGS.

- (35) Remove protective caps, connect and tighten hydraulic suction, pressure, and case drain self-sealing disconnects (Ref. Fig. 410), zone 432.

NOTE: Verify that hydraulic lines, from disconnects to pump, have been filled with hydraulic fluid.

- (36) Remove protective caps, connect fuel line (Ref. Fig. 411), and install and tighten bolts, zone 432.

- (37) Remove protective caps, connect and tighten P1 probe (Ref. Fig. 406), zone 435.

CAUTION: HAND TIGHTEN ELECTRICAL CONNECTOR PLUG SHELLS ONLY UNTIL THE FULLY COUPLED INDICATOR LINE IS COVERED AND THE THREADS HAVE BOTTOMED OUT TO ENSURE SELF LOCKING FEATURE HAS ENGAGED.

- (38) Remove protective caps and connect electrical connectors (Ref. Fig. 412).

EFFECTIVITY: ALL

001B

71-00-03
Page 441
Nov 15/87



MAINTENANCE MANUAL

NOTE: Ensure that harnesses P, S, C2, T, E, Q1, and G are removed from first clip/clampblock securing harnesses to engine. Ensure that harnesses G and Q1 are removed from second clip/clampblock. Do not remove clip/clampblock.

C
C

- (38A) Remove fuel lines (Stk Nbr. 61-1700, 60-4846 and 60-4849) and stow in the box on the shipping skid.

C
C
C

NOTE: Assure both the lines removed and those left exposed on the engine are properly capped (Ref. Fig. 406A).

- (39) Provide electrical power (Ref. 24-41-00) to aircraft, as required then remove tags and close circuit breakers opened in Step 3A(1)(g).
- (40) Push in engine No. 2 fire emergency shutoff control handle, zone 210, to open the firewall fuel and hydraulic shutoff valves (Ref. 28-24-10 and 29-11-32).
- (41) Pressure-check fuel system (Ref. 28-24-00) for leaks at engine fuel disconnect and drain plug.

NOTE: If the engine is installed with inhibiting oil in the fuel system, the inhibiting oil can be removed by wet motoring then dry motoring the engine before attempting an engine start (Ref. 71-00-00).

- (42) Pressure-check engine bleed air system (Ref. 71-00-03) for leaks at IP, HP, and starter duct engine disconnects.
- (43) Attach cowl seal assembly to the upper support structure (Ref. Fig. 403).

NOTE: The length and flexibility of the seal may cause seal to sag allowing it to protrude below the cowl.

- (44) Service engine oil system (Ref. 12-12-01).
- (45) Service engine starter system (Ref. 12-12-11).
- (46) Service thrust reverser motor (Ref. 12-12-71).
- (47) Service integrated drive generator oil system (Ref. 12-12-21).
- (48) Perform integrated drive generator Disconnect Test (Ref. 24-11-01).

R EFFECTIVITY: ALL

001B

71-00-03

Page 442
Nov 15/87



MAINTENANCE MANUAL

- (49) Perform pump priming and air bleeding operations (Ref. 29-11-07) then remove placards from hydraulic system panels.
- (50) Perform hydraulic system firewall shutoff valve Operational Test and hydraulic pump depressurization solenoid check (Ref. 29-11-32).
- (51) Perform fuel system firewall shutoff valve operational test (28-24-10).
- (52) Reinstall the following fairings, panels, and attachments (Ref. Fig. 402), zones 471 and 472:
 - (a) Support structure glove assembly, 472C
 - (b) Drag link bolt and bonding strap bolts
 - (c) Glove assembly doors, 472DL and 472DR
 - (d) Rear mount access doors, 471EL and 471DR
 - (e) Firewall access door assemblies, 471CL and 471BR
 - (f) Thrust reverser fairing panels, 435AL and 435AR
 - (g) Thrust reverser hoop plate fairing assemblies, 435BL and 435BR
 - (h) Aft fairing access panels, 472CL and 472CR
- (53) Install the following cowl panels, zones 433 and 434:
 - (a) LH and RH mid fixed cowls, 433CL and 434CR (Ref. 71-12-03)
 - (b) LH and RH lower hinged cowls, 433AL and 434AR (Ref. 71-12-01)
 - (c) LH and RH upper hinged cowls, 433DL and 434DR (Ref. 71-12-05)
- (54) Ensure that hydraulic system A pressure is available (Ref. 29-11-00) and extend tail skid with ground servicing control switch.
- (55) Remove workstand and miscellaneous equipment from immediate area of the aircraft.
- (56) Remove control column lock.

C. Removal (Sling)

R EFFECTIVITY: ALL
R
001B

71-00-03

Page 443
Nov 15/87



MAINTENANCE MANUAL

- (1) Check status of aircraft and systems and perform necessary functions in preparation for engine removal as follows:
 - (a) Ground aircraft to an approved grounding lug.
 - (b) Place engine No. 2 power control lever, zone 210, in fully retarded (ground idle) position. Ensure that thrust reverser lever is fully forward in ground idle position.
 - (c) Provide electrical power (Ref. 24-41-00), as required.
 - (d) Ensure that hydraulic system A pressure is available (Ref. 29-11-00) and retract tail skid with ground servicing control switch.
 - (e) Depressurize hydraulic systems B and C (Ref. 29-11-00) and placard hydraulic system panels.

CAUTION: THE FIRE EXTINGUISHING AGENT DISCHARGE SWITCH IS EXPOSED AND ARMED WHEN THE FIRE EMERGENCY ENGINE SHUTOFF CONTROL HANDLE HAS BEEN PULLED. DO NOT ACTUATE DISCHARGE SWITCH.

- (f) On the pilots overhead panel, zone 210, pull engine No. 2 fire emergency shutoff control to close the firewall fuel and hydraulic shutoff valves (Ref. 28-24-10 and 29-11-32).
- (g) On pilots overhead circuit breaker panel CB1, zone 210, open and tag circuit breakers FIRE EXTINGUISHER ENG 2 MAIN and ALTN (C12 and C13), THRUST REVERSE ENG 2 (H17), FUEL SHUTOFF VALVE TANK ENG 2 (D11) and HYD PUMP & FIREWALL SHUTOFF VALVE CONT SYS B and SYS C (L16 and L17).
- (h) Install control column lock.
- (i) Ensure that main landing gear wheels are chocked and all landing gear downlock safety pins are installed.

CAUTION: BALLAST IS REQUIRED TO PREVENT AIRCRAFT TIPPING IF NO. 2 ENGINE IS INSTALLED WITH AIRCRAFT ON JACKS AND NO. 1 AND NO. 3 ENGINES REMOVED.

- (j) Provide support, as necessary, for proper balance of aircraft during engine removal (Ref. 7-11-00 and 10-20-00).

R EFFECTIVITY: ALL

001B

71-00-03
Page 444
Nov 15/87



- (k) Position engine No. 2 workstand (Ref. Fig. 401) for maintenance.
- (2) Remove the following cowl panels, zones 433 and 434:
- (a) LH and RH upper hinged cowls, 433DL and 434DR (Ref. 71-12-05)
 - (b) LH and RH lower hinged cowls, 433AL and 434AR (Ref. 71-12-01)
 - (c) LH and RH mid fixed cowls, 433CL and 434CR (Ref. 71-12-03)
- NOTE: Replace barrel nuts if panel attach bolts do not meet a minimum back-off breakaway torque of at least 32 lb in.
- (3) Remove the following fairings, panels, and attachments (Ref. Fig. 402), zones 471 and 472:
- (a) Thrust reverser hoop plate fairing assemblies, 435BL and 435BR
 - (b) Thrust reverser fairing panels, 435AL and 435AR
 - (c) Firewall access door assemblies, 471CL and 471BR
 - (d) Rear mount access doors, 471EL and 471DR
 - (e) Glove assembly doors, 472DL and 472DR
 - (f) Drag link bolt and bonding strap bolts
 - (g) Support structure glove assembly, 472C
- NOTE: Tri-wing screws in firewall access doors and rear mount access doors may be replaced with hex-head bolts NAS6304 to reduce removal and installation time.
- (4) Remove bolts attaching cowl seal assembly to center engine support structure (Ref. Fig. 403). Pull seal assembly rub strips and seal aft over the thrust reverser firewall for stowage. Inspect cowl seal for damage and retain attaching parts for reinstallation.
- (5) Disconnect intermediate-pressure (IP) duct coupling (Ref. Fig. 404), zone 471, by removing double T-bolt V-band coupling (Ref. 20-36-02).



- (6) Position splitter area access work platform (Ref. Fig. 405) in cold-stream exhaust collector and nozzle, zone 435.
- (7) Remove interservices fairing LH and RH access panels, and LH and RH rear access panels to allow access to high-pressure (HP) duct disconnect (Ref. 72-03-00).
- (8) Disconnect HP duct hoop plate seal and coupling (Ref. Fig. 404), zone 435, by removing the hoop plate seal clamp and HP duct double T-bolt V-band coupling (Ref. 20-36-02).
- (9) Disconnect and cap P1 probe tube (Ref. Fig. 406).
- (10) With engine power control lever secured in fully retarded position, pull reverse thrust control lever, zone 210, toward reverse position and release to idle position.
- (11) Disconnect engine interface linkage rods (Ref. Fig. 407) by removing cotter pins, nuts, and bolts. Do not remove the upper bushing, lower bushing, or lock-wire.

NOTE: The upper bushing is held in place by the lock-wire, after the bolt has been removed, and may be adjusted slightly for installation or removal of the linkage rod. The lower bushing is threaded and should not be moved.
- (12) Disconnect starter duct coupling (Ref. Fig. 404), zone 432, by removing the double T-bolt V-band coupling (Ref. 20-36-02).
- (13) Disconnect and cap IP reference pressure line (Ref. Fig. 406). Secure line to aircraft structure to prevent damage during engine removal and installation.
- (14) Attach S-duct support strap to mid fixed cowl brackets and adjust strap buckles to support S-duct (Ref. Fig. 408).
- (15) Disconnect air intake adapter from engine fan case and compress air intake adapter slip joint (Ref. Fig. 409).

CAUTION: USE EXTREME CARE TO PREVENT DAMAGING HYDRAULIC HOSES BY BENDING, KINKING OR TWISTING.

- (16) Disconnect hydraulic suction, pressure, and case drain pump lines (Ref. Fig. 410), zone 432. Cover disconnects with protective caps to prevent contamination.



MAINTENANCE MANUAL

- (17) Drain fuel from fuel supply line into container by removing the drain plug (Ref. Fig. 411), zone 432. Reinstall drain plug and lock-wire.

CAUTION: WHEN THE FUEL HOSE IS DISCONNECTED IT MUST BE SUPPORTED TO ASSURE THE HOSE WILL NOT BE BENT BELOW MINIMUM BEND RADIUS OF 10.0 INCHES TO THE INSIDE SURFACE.

- (18) Disconnect fuel line (Ref. Fig. 411), zone 432, and cap lines with protective caps. Support the loose end of the hose to prevent damage.

C
C

- (18A) Remove fuel lines (Stk Nbr. 61-1700, 60-4846 and 60-4849) and stow in the box on the shipping skid.

C
C
C

NOTE: Assure both the lines removed and those left exposed on the engine are properly capped (Ref. Fig. 406A).

- (19) Disconnect, cap, and stow electrical QEC connectors (Ref. Fig. 412).

- (20) Position engine transportation base and multipurpose stand (Ref. Fig. 414) for receiving QEC unit.

- (21) Attach trunnion fittings to engine, zone 432, as follows:

- (a) Remove spherical bearings from engine stand forward supports, insert bearings into engine receptacle, and index for receiving trunion bolts (Ref. Fig. 414).

NOTE: Ensure that spherical bearing is free of burrs and nicks before inserting bearing into receptacle fitting.

- (b) Remove forward supports from engine stand and attach to spherical bearings in engine receptacle fittings.

- (c) Remove aft supports from engine stand and attach to engine with pins that secure links to bosses of handling plates.

- (22) Attach the overhead crane (Ref. Fig. 418) engine overhead sling and in-line hoist assembly.

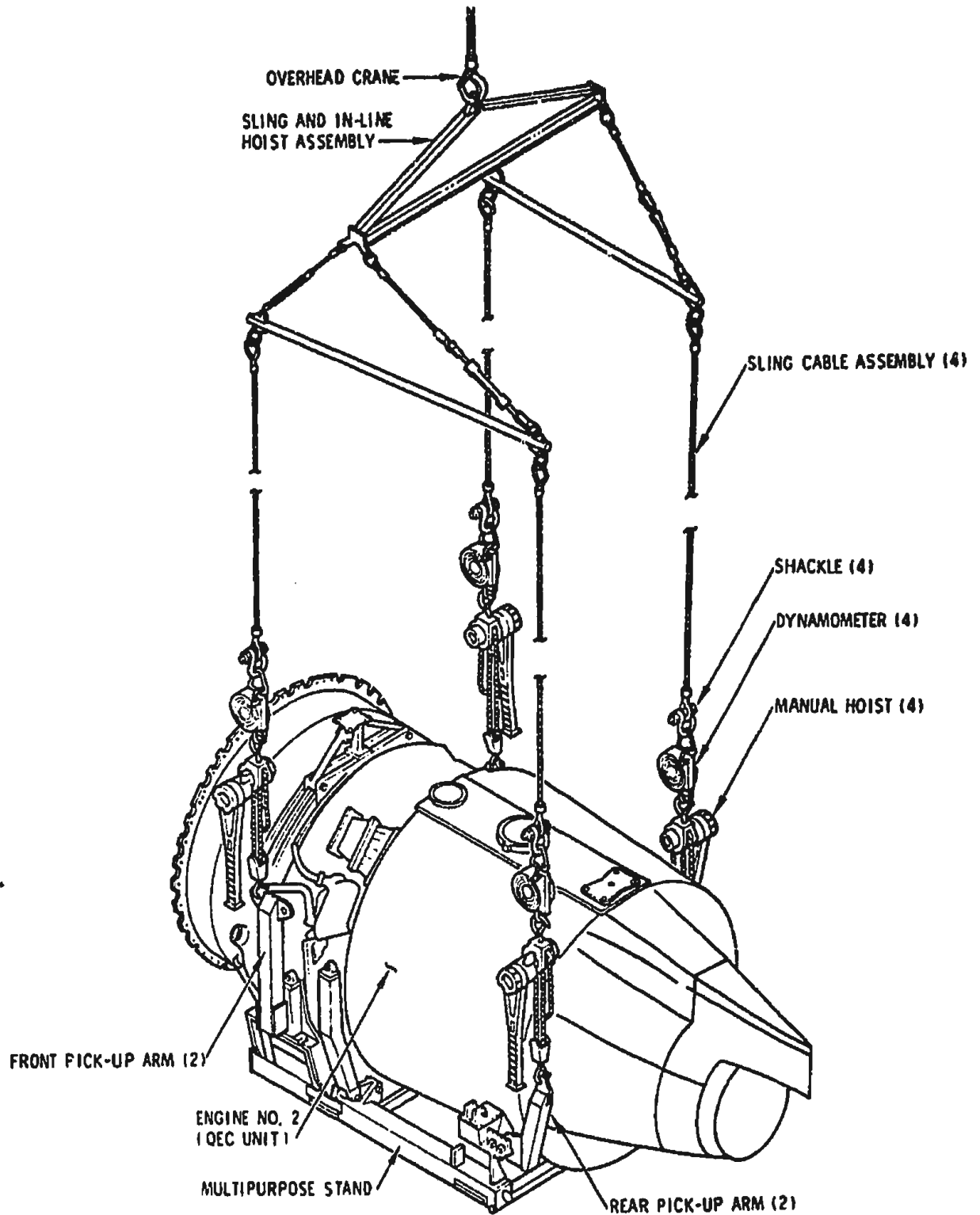
NOTE: The hoist assembly includes the spreader bars, cables, dynamometers, and manual hoists.

R EFFECTIVITY: ALL

001B

71-00-03
Page 447
Nov 15/87

LOCKHEED
MAINTENANCE MANUAL



M1-0102-71-449

Sling and In-line Hoist Assembly
Figure 419

R EFFECTIVITY: ALL
R
001B

71-00-03
Page 448
Nov 15/87



MAINTENANCE MANUAL

- (23) Attach sling assembly to multipurpose stand pickup arms, release swing bolts and disengage stand from transportation base (Ref. Fig. 414).
- (24) Hoist multipurpose stand into approximate position for attachment to QEC unit.
- (25) Attach supports to multipurpose stand.

NOTE: Adjust height of multipurpose stand as necessary to allow attachment of trunnions.

CAUTION: DO NOT EXCEED 7000 POUNDS LOAD ON A SINGLE FORWARD HOIST OR 4500 LB ON A SINGLE REAR HOIST. MAINTAIN EQUAL LOADS SIDE-TO-SIDE WITHIN ± 1000 LB BETWEEN THE FRONT DYNAMOMETERS AND BETWEEN THE REAR DYNAMOMETERS.

- (26) Preload dynamometers to ensure that hoists accept weight of engine and multipurpose stand as follows:
 - (a) Determine weight of engine multipurpose stand.
 - (b) Add No. 2 engine weight of 12,580 lbs, weight of multipurpose stand, and 1000 lbs preload for a total load.
 - (c) Distribute the load approximately as follows:
 - 70 percent equally divided between two forward hoists
 - 30 percent equally divided between two rear hoists

WARNING: THE ENGINE MOUNT BOLTS MAY NOT BE LOOSENED BEFORE TAKING UP THE ENGINE WEIGHT WITH THE HOISTING EQUIPMENT.

- (27) Remove front and rear engine mount bolts (Ref. Fig. 415 and 416), zone 471. Tool GL-72-HA-1 (Ratchet Adapter) may be used to place a socket on the bolt head.

NOTE: If thread damage is evident on mount bolts, inspect nuts for thread wear or damage.

- (28) Lower QEC unit slowly, guiding it free of all interfaces.
- (29) Traverse the QEC unit aft to allow for clearance between the engine nose cone and air intake adapter, then lower and position unit on transportation base.

R EFFECTIVITY: ALL

001B

71-00-03
Page 449
Nov 15/87



MAINTENANCE MANUAL

- (30) Secure multipurpose stand to transportation base by properly positioning and tightening swing bolts.
- (31) Detach in-line hoist assembly (Ref. Fig. 418) from multipurpose stand attachment points.
- (32) Retract the hoist cables, move the in-line hoist assembly clear of the aircraft, and lower the assembly to the floor.
- (33) Detach the overhead sling and in-line hoist assembly from the overhead crane.
- (34) Inspect exposed surfaces of V-flange seals (E-seals) in flanges of IP, HP, starter (Ref. Fig. 404), gearbox breather, and fuel drain tank vent ducts for deformation, nicks, dents, or tears. Remove and replace damaged seals.

NOTE: E-seals are manufactured slightly out-of-round for secure fit in male portion of ducting joints. Most common defects will be nicks, dents, cuts, or deformation from flat plane. Do not remove any seals for inspection if they appear to be in satisfactory condition.
- (35) Place dust covers over QEC unit and related aircraft exposed ducts.
- (36) Remove splitter area access work platform from cold-stream collector.
- (37) Move transportation base to clear area for replacement of QEC unit.

D. Installation (Sling)

- (1) Check that aircraft is in configuration established for removal [Step 3C(1)]. Inspect air intake adapter bearing strip for correct clearance (Ref. 71-12-07).

NOTE: The thrust reverser airmotor oil reservoir can be filled and the level checked while the engine is installed on the multi-purpose stand by using the No. 2 engine position full mark on the airmotor oil dipstick. This oil level will then be correct when the engine is installed in any of the three positions on the aircraft.



MAINTENANCE MANUAL

CAUTION: ENGINE MOUNT NUTS, BOLTS, AND MOUNT BOLT HOLES MUST BE INSPECTED EACH INSTALLATION FOR SCORES, BURRS, AND ABRASIONS.

PRIOR TO AND DURING ENGINE INSTALLATION, CHECK THAT ENGINE FRONT AND REAR MOUNTS UPPER AND LOWER SURFACES, BOLT HOLES AND SHEAR PIN BLIND HOLES (THESE LOCATE WITH AIRFRAME MOUNTED SHEAR PINS) ARE FREE FROM DAMAGE, OIL, GREASE OR ANY OTHER FOREIGN MATERIAL. USING SOLVENT, WIPE CLEAN AS NECESSARY.

- (2) Inspect engine mount bolts and mount bolt holes each installation. Inspect nuts for cracks, thread wear or damage, and loose fit. Noticeable distortion or scratches deep enough to reduce efficiency of the threads is cause for rejection. The threads must remain in a serviceable condition and permit free installation with the fingers up to the self locking element. Reject bolts and nuts having stripped or cross threaded threads. If bolt/nut combinations, lubricated with MIL-T-5544, do not have a back-off breakaway torque of at least 70 pound-inches (back-off breakaway torque refers to minimum torque required after initial unseating), or if the free running torque while tightening is more than 800 pound-inches, reject the used nut. If same torque requirements cannot be met with a new nut, reject the bolt. Burrs, abrasions, or score marks must be fingernail smooth (Ref. Table 401 and Fig. 420) with the following limitations:

R

- (a) Rework is not permitted on the bolt shank within 0.3 inch of the bolt head.

NOTE: Limit does not apply to Vibratory Rework Method.

- (b) Rework must be held to a minimum, with a smooth transition from the normal diameter to the rework diameter.
- (c) The root radius of any score or scratch must be smoothed to 0.090 inch.
- (d) Machine-powered grinding is not permitted on bolts or bushings.
- (e) Rework bolthead flat surface to a maximum depth of .003 inches. Rework must be done by hand.

EFFECTIVITY: ALL

001B

71-00-03
Page 451
May 15/90



MAINTENANCE MANUAL

NOTE: If hand reworking is impractical, see Structural Repair Manual 54-00-00 for alternate method.

CAUTION: THE FORK MUST BE INSTALLED IN ALIGNMENT PIN GROOVE PRIOR TO SECURING PIN IN MOUNT TO CONTROL PIN PENETRATION AND PREVENT DAMAGE TO MOUNT BOLT NUTS.

- (3) Install alignment pins in aircraft side of engine front mount (Ref Fig. 415, 416, and 417); thread alignment pins into engine side of rear mount (one pin in forward hole and one in diametrically opposite rear hole of each mount).
- (4) Attach cowl seal assembly (Ref. Fig. 403) to replacement engine. Pull seal assembly rub strips and seal aft over thrust reverser firewall for stowage.
- (5) Ensure that V-flange seals (E-seals) are installed properly in the IP, HP, starter ducting, and in gearbox breather duct. Ensure that hoop plate seal suspension links are disconnected from support bracket (Ref. Fig. 416).
- (6) Install aircraft linkage rig pin (Ref. Fig. 407).

NOTE: With engine power control lever secured in fully retarded position, it may be necessary to pull reverse thrust control lever, zone 210, toward reverse position and to release it in the idle position to align rig pin holes.

- (7) Lubricate mount bolts under bolt head, on shank, and on threads with MIL-T-5544, or equivalent lubricant.

CAUTION: WHEN INSTALLING A REVERSER, WHETHER BY ITSELF OR AS PART OF A REPLACEMENT ENGINE, ALWAYS CONFIRM THE CASCADE CONFIGURATION AGAINST MAINTENANCE MANUAL CHART AND MAKE CERTAIN IT IS CONFIGURED FOR THE ENGINE POSITION FOR WHICH IT IS TO BE INSTALLED (Ref 78-31-20).

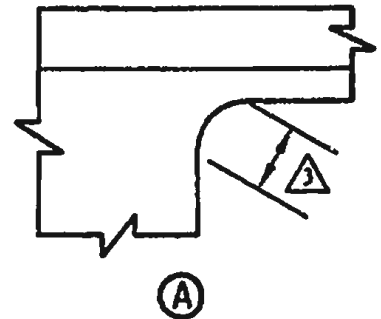
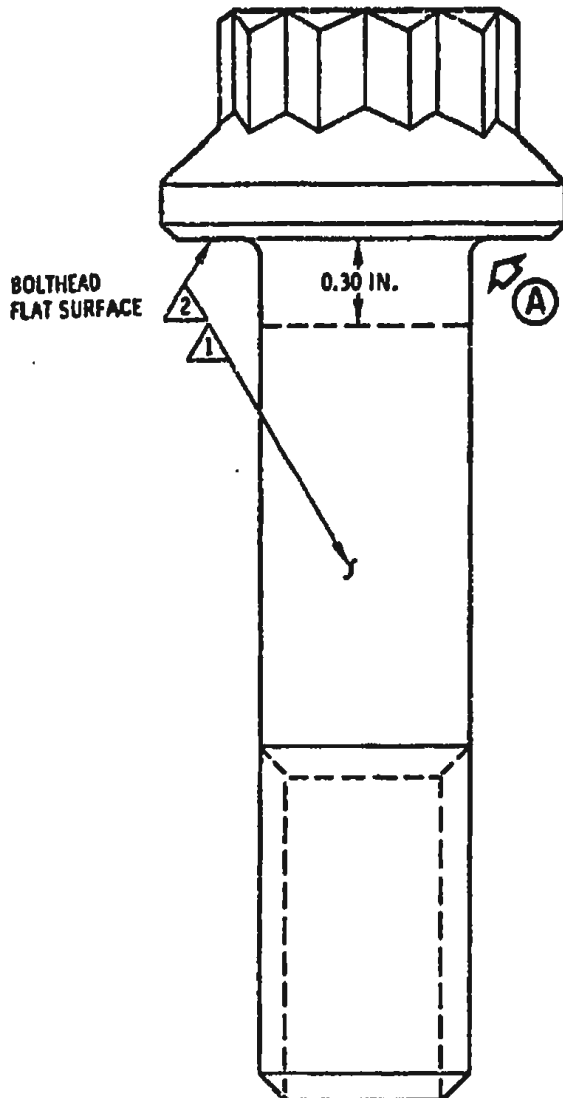
- (8) Place the replacement QEC unit in position under the aircraft in preparation for installation.
- (9) Ensure splitter area access work platform has been installed
- (10) Attach the overhead crane (Ref. Fig. 418) to the No. 2 engine overhead sling and in-line hoist assembly.

R EFFECTIVITY: ALL

001B

71-00-03
Page 452
Nov 15/87

LOCKHEED
MAINTENANCE MANUAL



CAUTION

NO POWER GRINDING PERMITTED

NOTE

- ① LIGHT SCUFFS AND SCRATCHES THAT CANNOT BE FELT WITH THE FINGERNAIL REQUIRE NO REWORK. ABRASIONS, SCUFFS, SCRATCHES OR SCORES THAT CAN BE FELT WITH THE FINGERNAIL MUST BE FAIRED OUT TO BLEND SMOOTHLY WITH THE BOLT SHANK. BOLT DIAMETER AFTER REWORK MUST NOT BE LESS THAN 0.9880 INCHES AT ANY POINT.
- ② CIRCUMFERENTIAL SCRATCHES, SCORES OR GROOVES ON THE FLAT OF THE BOLT HEAD ARE PERMISSIBLE TO A MAXIMUM DEPTH OF 0.003 INCHES.
- ③ NO REWORK PERMITTED IN THIS AREA (DOES NOT APPLY TO VIBRATORY METHOD OF REWORK)

M1-0001-71-460

Engine Mount Bolt Limitations
Figure 420

R EFFECTIVITY: ALL

001B

71-00-03
Page 453
Aug 15/82



MAINTENANCE MANUAL

- (11) Raise the hoist assembly and position it over the replacement QEC unit.
- (12) Attach sling assembly to multipurpose stand pickup arms then release swing bolts and disengage stand from transportation base (Ref. Fig. 414).
- (13) Actuate hoists to remove slack from cables until each dynamometer indicates approximately 1000 pounds.
- (14) Remove protective covers and caps from ducts and openings.

CAUTION: THE ENGINE MOUNT SHEAR PIN MUST BE SECURED IN THE SUPPORT STRUCTURE FRONT ENGINE MOUNT SPIDER PRIOR TO ENGINE INSTALLATION.

- (15) On aircraft 001-014,
verify that shear pin is secured in support structure front engine mount.

CAUTION: THE FRONT AND REAR ENGINE MOUNT SHEAR PINS MUST BE SECURED IN SUPPORT STRUCTURE ENGINE MOUNTS PRIOR TO ENGINE INSTALLATION.

- (15) On aircraft 015-999,
verify that shear pins are secured in support structure front and rear engine mounts.
- (16) Raise QEC unit and traverse it forward to preinstallation position (within approximately 4 inches) of mounts allowing for clearance between nose cone and air intake adapter.

NOTE: During all phases of mating the QEC unit to the fuselage, monitor all interfaces for proper clearance.

- (17) Hoist QEC unit slowly to within approximately three-sixteenths inch of front and rear mounts while directing alignment pins into proper mounting holes (Ref. Fig. 415 and 416). Check for contact of air intake adapter and engine fan case.

CAUTION: DO NOT ATTEMPT TO RAISE QEC UNIT WITH BOLTS. DAMAGE TO BOLTS AND MOUNTS COULD OCCUR.

WASHERS MUST BE INSTALLED WITH COUNTERSINK TOWARD BOLT HEAD.

R EFFECTIVITY: ALL

001B

71-00-03
Page 454
Nov 15/87



MAINTENANCE MANUAL

- (18) Install forward mount bolts and washers (countersink toward head of bolt) and rear mount bolts in holes that do not contain alignment pins.
- (19) Remove alignment pins from both mounts and install remaining mount bolts and washers. Bolts should be fingertight.

CAUTION: DO NOT EXCEED LOAD OF 7000 LB ON A SINGLE FORWARD HOIST OR 4500 LB ON A SINGLE REAR HOIST. MAINTAIN EQUAL LOADS SIDE-TO-SIDE WITHIN ± 1000 LB BETWEEN THE FRONT DYNAMOMETERS AND BETWEEN THE REAR DYNAMOMETERS.

- (20) Raise QEC unit to engage front and rear mounts. Apply an upward load (preload, in addition to the engine and stand weight) of approximately 500 lbs on each mount pad (250 lbs per dynamometer).

NOTE: Verify that bolt threads and nut self self-locking feature have been checked as required in Step D (2).

- (21) Torque all mount bolts to 700 (± 50) lb ft.

NOTE: If access to the bolts is difficult, tool No. GL-72-HA-1 (Ratchet Adapter) may be used as per Fig. 418, paying close attention to the torque application chart.

The bolts at each mount are to be torqued first across the diagonals, then in sequence around the bolt pattern so that each bolt is torqued twice. In the event engine mount bolts are incorrectly torqued, assuming they have not been torqued to more than 950 lb ft, retorquing can be accomplished as follows:

- (a) Loosen each bolt, following the torque pattern, and retorque before loosening next bolt.
- (b) Removal of any bolt for inspection can be accomplished during the sequence.

NOTE: After mount bolts are properly torqued, clean area on the bolt, and mount and apply tamper proof putty (TWA Stk. Nbr. 50-1065) at approximately 0.5 inch diameter.

- (22) Lubricate air intake adapter to engine fan case bolts under bolt heads, on shanks and on threads with MIL-T-5544 or equivalent lubricant.

EFFECTIVITY: ALL

71-00-03
Page 455
Dec 15/91



MAINTENANCE MANUAL

- (23) Install and tighten air intake adapter to engine fan case bolts to a torque value of 225 to 277 lb in. (Ref. Fig. 409). Remove S-duct support strap.
 - (24) Decrease load until dynamometers indicate approximately weight of multipurpose stand and detach trunnion bolts, trunnions, and supports from QEC unit, zone 433.
 - (25) Lower stand and secure to transportation base.
 - (26) Remove spherical bearings from engine receptacle fittings.
 - (27) Detach in-line hoist assembly (Ref. Fig. 418) from multipurpose stand and move transportation base clear of area.
 - (28) Retract the hoist cables, move the in-line hoist assembly clear of the aircraft, and lower the assembly to the floor.
 - (29) Detach the overhead sling and in-line hoist assembly from the overhead crane.
 - (30) Connect HP duct hoop plate seal and coupling (Ref. Fig. 404), zone 435. Secure with hoop plate seal clamp and HP duct double T-bolt V-band coupling (Ref. 20-36-02). Reconnect support cable linkage from the (HP) duct to the (TR) duct.
- NOTE:** It may be necessary to use a wood or micarta block approximately 30 inches long, 3-3/4 inches high, and 1-3/4 inches wide to assist in connecting HP duct.
- (31) Install interservices fairing LH and RH access panels, and LH and RH rear access panels (Ref. 72-03-00).
 - (32) Remove splitter area access work platform.
 - (33) Connect IP duct coupling (Ref. Fig. 404), zone 432, and secure with double T-bolt V-band couplings (Ref. 20-36-02).

CAUTION: THE STARTER DUCT DOUBLE T-BOLT V-BAND COUPLING, MID-WAY BETWEEN THE STARTER AND START VALVE, SHOULD BE INSTALLED WITH ITS BOLTS IN A VERTICAL POSITION TO PREVENT CONTACT WITH THE S-DUCT ADAPTER AFT RING.

- (34) Verify that starter duct V-band coupling, mid-way between the starter and start valve, is installed with

R
R
001B EFFECTIVITY: ALL

71-00-03
Page 456
Dec 15/91



its bolts in a vertical position. Connect starter duct coupling (Ref. Fig. 404) and secure with double T-bolt V-band couplings (Ref. 20-36-02).

- (35) Release IP reference pressure line from stowed position and secure to engine connection (Ref. Fig. 406).
- (36) Connect engine (throttle) interface linkage rods (Ref. Fig. 407), zone 432. Remove and stow rig pins.
- (37) Ensure that hoop plate suspension links are connected (Ref. Fig. 416).
- (38) Remove protective caps and connect hydraulic suction, pressure, and case drain self-sealing disconnects (Ref. Fig. 410), zone 432.

CAUTION: USE EXTREME CARE TO PREVENT DAMAGING HYDRAULIC HOSES BY BENDING, KINKING OR TWISTING. PREVENT INTRODUCTION OF TWISTING PRELOAD IN HOSES WHEN TIGHTENING FITTINGS.

NOTE: Verify that hydraulic lines, from disconnects to pump, have been filled with hydraulic fluid.

- (38A) Remove fuel lines (Stk Nbr. 61-1700, 60-4846 and 60-4849) and stow in the box on the shipping skid.

NOTE: Assure both the lines removed and those left exposed on the engine are properly capped (Ref. Fig. 406A).

- (39) Remove protective caps and connect fuel line (Ref. Fig. 411), and install and tighten bolts, zone 432.
- (40) Remove protective caps, connect and tighten P1 probe (Ref. Fig. 406), zone 435.

NOTE: Physically check that all sections at inlet adapter and engine case are connected, and check for installation and safety of plug cap on unused P1 tee fitting.

CAUTION: HAND TIGHTEN ELECTRICAL CONNECTOR PLUG SHELLS ONLY UNTIL THE FULLY COUPLED INDICATOR LINE IS COVERED AND THE THREADS HAVE BOTTOMED OUT TO ENSURE SELF LOCKING FEATURE HAS ENGAGED.

- (41) Remove protective caps and connect electrical connectors (Ref. Fig. 412).

R EFFECTIVITY: ALL

001B

71-00-03
Page 457
Dec 15/91



NOTE: Ensure that harnesses P, S, C2, T, E, Q1 and G are removed from first clip/clampblock securing harness to engine. Ensure that harnesses G and Q1 are removed from second clip/clampblock. Do not remove clip/clampblocks.

- (42) Provide electrical power (Ref. 24-41-00) to aircraft, as required.
- (43) Remove tags and close circuit breakers opened in Step 3C(1)(g).
- (44) Push in engine No. 2 fire emergency shutoff control handle, zone 210, to open the firewall fuel and hydraulic shutoff valves (Ref. 28-24-10 and 29-11-32).
- (45) Pressure-check fuel system (Ref. 28-24-00) for leaks at engine fuel disconnect and drain plug.

NOTE: If the engine is installed with inhibiting oil in the fuel system, the inhibiting oil can be removed by wet motoring then dry motoring the engine before attempting an engine start (Ref. 71-00-00).

- (46) Pressure-check engine bleed air system (Ref. 71-00-03) for leaks at IP, HP, and starter duct engine disconnects.
- (47) Attach cowl seal assembly to the upper support structure (Ref. Fig. 403).

NOTE: The length and flexibility of the seal may cause seal to sag allowing it to protrude below the cowl.

- (48) Service engine oil system (Ref. 12-12-01).
- (49) Service engine starter system (Ref. 12-12-11).
- (50) Service thrust reverser motor (Ref. 12-12-71).
- (51) Service integrated drive generator oil system (Ref. 12-12-21).
- (52) Perform integrated drive generator Disconnect Test (Ref. 24-11-01).
- (53) Perform pump priming and air bleeding operations (Ref. 29-11-07) then remove placards from hydraulic system panels.

LOCKHEED



MAINTENANCE MANUAL

- (54) Perform hydraulic system firewall shutoff valve Operational Test and hydraulic pump depressurization solenoid check (Ref. 29-11-32).
- (55) Perform fuel system firewall shutoff valve operational test (Ref. 28-24-10).
- (56) Reinstall the following fairings, panels, and attachments (Ref. Fig. 402), zones 471 and 472:
 - (a) Support structure glove assembly, 472C
 - (b) Drag link bolt and bonding strap bolts
 - (c) Glove assembly doors, 472DL and 472DR
 - (d) Rear mount access doors, 471EL and 471DR
 - (e) Firewall access door assemblies, 471CL and 471BR
 - (f) Thrust reverser fairing panels, 435AL and 435AR
 - (g) Thrust reverser hoop plate fairing assemblies, 435BL and 435BR
- (57) Install the following cowl panels, zones 433 and 434:
 - (a) LH and RH mid fixed cowls, 433CL and 434CR (Ref. 71-12-03)
 - (b) LH and RH lower hinged cowls, 433AL and 434AR (Ref. 71-12-01)
 - (c) LH and RH upper hinged cowls, 433DL and 434DR (Ref. 71-12-05)
- (58) Ensure that hydraulic system A pressure is available (Ref. 29-11-00) and extend tail skid with ground service control switch.
- (59) Remove workstand and miscellaneous equipment from immediate area of the aircraft.
- (60) Remove control column lock.

R
R
001B EFFECTIVITY: ALL

71-00-03
Page 459/460
Dec 15/91

LOCKHEED



MAINTENANCE MANUAL

FUSELAGE-MOUNTED QEC UNIT (ENGINE NO. 2) - APPROVED REPAIRS

1. General

The following procedure provides repair instructions for the cowl seal located at power plant station 128.5 of the No. 2 engine. The flexible seal encircles the engine at the thrust reverser firewall to limit airflow in the engine accessory section and aid in firex agent containment.

The seal is attached to and supported by the thrust reverser firewall, center engine support structure, and mid fixed cowl. Seal rub strips mate to the upper hinged cowl and lower hinged cowls completing the enclosure of the engine accessory section.

2. Equipment and Materials

Seal patch material, PN 1544684 (10 inch width), or equivalent

Seal patch material, PN 1570212 (8 inch width), or equivalent

3. Referenced Procedures

71-12-01 LH and RH Lower Hinged Cowls - Servicing

71-12-05 LH and RH Upper Hinged Cowl - Servicing

4. Approved Repair - Cowl Seal

A. Defect and Repair Criteria

It is more practical to repair most damaged seals than to replace them. Repair of the seal consists of applying a seal patch under the following conditions:

- (a) Cuts of more than 12 inches in length.
- (b) Damage conditions of more than 12 square inches missing seal.
- (c) Cuts extending into the front or rear edges of the seal material.

B. Repair

EFFECTIVITY: ALL

001F

71-00-03

Page 801
May 15/77

LOCKHEED



MAINTENANCE MANUAL

- (1) Open applicable lower hinged cowl 433AL or 434AR (Ref. 71-12-01), or upper hinged cowl 433DL or 434DR (Ref. 71-12-05), to gain access to seal damaged area.

- (2) Locate damaged area of seal.

- (3) Remove enough bolts, attaching seal to thrust reverser firewall and seal support, to allow for installing patch (Ref. Fig. 801).

NOTE: Allow for a 12-inch overlap either side of damaged area.

- (4) Cut away damaged section of seal. Ensure that edges of seal area to be patched are smooth and free of cuts or rips.

- (5) Cut patch of sufficient length to cover 12 inches either side of repair area.

NOTE: Use applicable patch material to match original seal material.

- (6) Position seal patch, on the inboard side of the seal, providing for 12-inch overlap on each side of repair area.

- (7) Punch eight holes minimum on each side of patch to match existing holes of support and firewall.

R

CAUTION: DO NOT USE ADHESIVE BONDING.

- (8) Secure patch to seal with attaching bolts.

- (9) Close applicable cowl.

EFFECTIVITY: ALL

001F

71-00-03

Page 802
Aug 15/81



EFFECTIVITY: ALL

71-00-03
Page 803/804
May 15/77



R BB211-22B-02/RB211-524B-02 CONVERSION/RECONVERSION

R 1. General

R There will be occasions when the appropriate engine equipped QEC
R unit is unavailable for installation after it has been
R determined that an engine change is necessary. Under these
R circumstances it may be necessary to intermix engines. Engine
R intermix is authorized by SB093-71-036.

R The following procedure is based on using engines which are in
R the neutral configuration (no inlet installed).

R 2. Referenced Procedures

R	SB71-036	RB211-22B-02 and RB211-524B-02 Engine Installation
R		Conversion/Reconversion
R	11-32-10	Flight Station Interior Markings, Zone 210 -
R		Description and Operation
R	36-11-11	Bleed Temperature Sensor - Removal and Installation
R	54-51-54	Wing Pylon Glove Fairing - Removal and Installation
R	54-52-53	Center Engine Glove Fairing - Removal and
R		Installation
R	71-00-01	Wing Mounted QEC Unit - Removal and Installation
R	71-00-03	Fuselage Mounted QEC (Engine No. 2) - Removal and
R		Installation
R	71-11-03	Nose Cowl - Removal and Installation
R	71-12-06	IP(N2) Engine Shaft Speed Indicator - Removal and
R		Installation
R	79-34-02	Oil Temperature Indicator - Removal and
R		Installation
R		Airplane Flight Manual
R		Weight and Balance Manual

LOCKHEED
MAINTENANCE MANUAL

R 3. Intermix Chart for Conversion/Reconversion

R A. Summary of AIRCRAFT PART DIFFERENCES with IPC References
R (Ref. Fig. 401).

R 4. Conversion/Reconversion of Wing Mounted QEC Unit

R A. Conversion from RB211-22B-02 Engine to RB211-5248-02 Engine

R (1) Remove LJ21745(E21) inlet (Ref. MM 71-11-03).

R NOTE: If the LJ21745(E21) inlet is to be used on the
R RB211-524B engine, retain for reuse.

R (2) If the LJ21745(E21) inlet is to be used on the
R RB211-524B engine, proceed as follows:

R (a) Remove LJ22155 anti-ice duct and retain for reuse.

R (b) Remove LJ17325 and LJ17326 starter duct assemblies
R and retain for reuse.

R (3) Remove RB211-22B-02 engine equipped QEC unit (Ref. MM
R 71-00-01).

R (4) On the 1607740-115 glove fairing assembly, proceed as
R follows (Ref. MM 54-51-54, IPC 54-51-02 and Fig. 402):

R (a) Remove NAS5703U10 screws (7 places each side) and
R 1608677-101 and -102 door assemblies.

R (b) Remove NAS5103U3 bolts, AN960D10 washers and
R 1608678-101 and -102 clips.

R (c) Install 1607741-101 and -102 door assemblies with
R NAS4503U3 bolts (7 places each side).

R (5) On the 1560585-101 wing pylon bleed air system, proceed
R as follows (Ref. Fig. 402, MM 36-11-11 and IPC
R 36-11-03):

R (a) Remove 672274-115 ejector.

R (b) Remove 1545461-113 tube assembly, R45116P-0604
R adapter and 20202CL4 seal.

R (c) Remove MS20500-428 nuts, AN960C416L washers,
R NAS6304U11 bolts, 672496-109 temperature sensor
R and 613A51-0007-1 seal.



MAINTENANCE MANUAL

- R (d) Remove 741592-101 temperature sequence switch and
R 12100CL8 seal.
- R (e) Remove 740895-103 over temperature switch and
R 12100CL8 seal.
- R (f) Install new 12100CL8 seal and 741889-101 over
R temperature switch.
- R (g) Install new 12100CL8 seal and 741801-103
R temperature sequence switch.
- R (h) Install 613A51-0007-1 seal and 673872-103
R temperature sensor with NAS6304U11 bolts,
R AN960C416L washers and MS20500-428 nuts.
- R (i) Install 801A50-0003B seal, R45116T-0403 adapter
R and 1545461-121 tube assembly.
- R (j) Install 672274-123 ejector.
- R (k) Install Type 2 GR.B teflon tape on 741279-109 fuel
R line with MS35842-12 clamps (Ref. Fig. 402).
- R (6) Install RB211-524B engine equipped QEC unit (Ref. MM
R 71-00-01).
- R (7) If the LJ21745(E21) inlet is to be installed, proceed
R as follows:
- R (a) Remove LJ26637 and LJ26661 starter duct assemblies
R and install LJ17325 and LJ17326 starter duct
R assemblies retained in Step 4A(2)(b).
- R (b) Remove LJ28082 anti-ice duct and install LJ22155
R anti-ice duct retained in Step 4A(2)(a).
- R (c) Install LJ21745(E21) inlet retained in Step 4A(1)
R (Ref. MM 71-11-03).
- R (7) If the LJ28097(G8) inlet is to be installed, proceed as
R follows (Ref. Fig. 402):
- R (a) Remove NAS5804U13 screws and 1507119-101 panel.
- R (b) Install 1608877-107 bracket assembly with
R NAS5204U9 screws.
- R (c) Install 1608876-103 fairing with AN960D416
R washers, and NAS6204-4 and NAS5704U11 bolts.
- R (d) Install 1608873-101 panel with NAS5704U9 bolts.

EFFECTIVITY: 032, 033

71-00-06

Page 403
Feb 15/82



MAINTENANCE MANUAL

- R (e) Install LJ28097(G8) inlet (Ref. 71-11-03).
- R (8) Package, tag and store removed parts with Reconversion
R kit for future reversion.
- R (9) Ensure engine designation placard on pilots center
R instrument panel indicates correct engine/duct
R combination and position (Ref. MM 11-32-10).
- R (10) Make appropriate entry in aircraft log book.
- R (11) Consult Airplane Flight Manual and Weight and Balance
R Manual for specific configuration operating
R limitations.
- R B. Reconversion from RB211-524B-02 Engine to RB211-22B-02
R Engine
- R (1) If the LJ28097(G8) inlet was installed proceed as
R follows (Ref. Fig. 402):
- R (a) Remove LJ28097(G8) inlet (Ref. MM 71-11-03).
- R (b) Remove NAS5704U9 bolts and 1608873-101 panel.
- R (c) Remove NAS5704U11 and NAS6204-4 bolts, AN960D416
R washers and 1608876-103 fairing.
- R (d) Remove NAS5204U9 screws and 1608877-107 bracket.
- R (e) Install 1507119-101 panel with NAS5804U13 screws.
- R (1) If the LJ21745(E21) inlet was installed, proceed as
R follows:
- R (a) Remove LJ21745(E21) inlet and retain for reuse
R (Ref. MM 71-11-03).
- R (b) Remove LJ22155 anti-ice duct and install LJ28082
R anti-ice duct.
- R (c) Remove LJ17325 and LJ17326 starter duct assemblies
R and install LJ26637 and LJ26661 starter duct
R assemblies.
- R (2) Remove RB211-524B-02 engine equipped QEC unit (Ref. MM
R 71-00-01).
- R (3) On the 1560585-101 wing pylon bleed air system, proceed
R as follows (Ref. Fig. 402, MM 3611-11 and IPC
R 36-11-03):

EFFECTIVITY: 032, 033

71-00-06

Page 404
Feb 15/82

LOCKHEED
MAINTENANCE MANUAL

- R (a) Remove 672274-123 ejector.
- R R (b) Remove 1545461-121 tube assembly, R45116T-0403
adapter and 801A50-0003B seal.
- R R R (c) Remove MS20500-428 nuts, AN960C416L washers,
NAS6304U11 bolts, 673872-103 temperature sensor
and 613A51-0007-1 seal.
- R R (d) Remove 741801-103 temperature sequence switch and
12100CL8 seal.
- R R (e) Remove 741889-101 over temperature switch and
12100CL8 seal.
- R R (f) Install new 12100CL8 seal and 740895-103 over.
temperature switch.
- R R (g) Install new 12100CL8 seal and 741592-101
temperature sequence switch.
- R R R (h) Install 613A51-0007-1 seal and 672496-109
temperature sensor with NAS6304U11 bolts,
AN960C416L washers and MS20500-428 nuts.
- R R (i) Install 20202CL4 seal, R45116P-0604 adapter and
1545461-113 tube assembly.
- R (j) Install 672274-115 ejector.
- R R (4) On the 1607740-115 glove fairing assembly, proceed as
follows (Ref. MM 54-51-54, IPC 54-51-02 and Fig. 402):
- R R (a) Remove NAS4503U3 bolts (7 places each side) and
1607741-101 and -102 door assemblies.
- R R (b) Install 1608678-101 and -102 clips with AN960D10
washers and NAS5103U3 bolts.
- R R (c) Install 1608677-101 and -102 door assemblies with
NAS5703U10 screws (7 places each side).
- R R (5) Rework existing (engine) LT harness essential services
loom assembly as follows (Ref. RR SB71-4162 Para. 2D).
- R R (a) Disassemble connector and ejector pins. Remove
shell/insert assembly.
- R R (b) Install new 3803702 shell/insert assembly and
re-assembly connector.



MAINTENANCE MANUAL

- R (c) Disconnect Q1 pylon interface essential services
R plug and disassemble plug from loom. Retain
R attaching hardware for installation with new plug.
- R (d) Remove existing 3507541 (LK53923) identification
R sleeve from loom and discard.
- R (e) Install new 3507480 (LK67754) identification
R sleeve.
- R (f) Re-assemble plug on loom with attaching hardware
R retained in Step (c). Connect Q1 pylon interface
R essential services plug.
- R (g) Test loom for insulation, resistance and
R continuity.
- R (6) Install RB211-22B-02 engine equipped QEC unit (Ref. MM
R 71-00-01).
- R (7) Install LJ17325 and LJ17326 starter duct assemblies
R removed in Step 4B(1)(c).
- R (8) Install LJ22155 anti-ice duct retained in Step
R 4B(1)(b).
- R (9) Install the LJ21745(E21) inlet retained in Step
R 4B(1)(a) (Ref. MM 71-11-03).
- R (10) Package, tag and store removed parts with conversion
R kit for future conversion.
- R (11) Ensure engine designation placard on pilots center
R instrument panel indicates correct engine/duct
R combination and position (Ref. MM 11-32-10).
- R (12) Make appropriate entry in aircraft log book.
- R (13) Consult Airplane Flight Manual and Weight and Balance
R Manual for specific configuration operating
R limitations.

R 5. Conversion/Reconversion of Fuselage Mounted QEC Unit

R A. Conversion from RB211-22B-02 Engine to RB211-524B-02 Engine

- R (1) Remove RB211-22B-02 engine equipped QEC unit (Ref. MM
R 71-00-03).

LOCKHEED



MAINTENANCE MANUAL

- R (2) Remove 1544137-101 glove fairing assembly and install
R 1607515-101 glove fairing assembly (Ref. MM 54-52-53,
R IPC 54-52-04 and Fig. 402):
- R (3) On 1560590-101 bleed air system, proceed as follows
R (Ref. MM 36-11-11, IPC 36-11-06 and Fig. 402):
- R (a) Remove 672274-115 ejector.
- R (b) Remove 1550342-113 tube assembly, R45116P-0604
R adapter and 12100CL4 seal.
- R (c) Remove LH7875-4 nuts, AN960C416L washers,
R 672496-109 temperature sensor and 613A51-0007-1
R seal.
- R (d) Remove 741592-101 temperature sequence switch and
R 12100CL8 seal.
- R (e) Remove 740895-103 over temperature switch and
R 12100CL8 seal.
- R (f) Install new 12100CL8 seal and 741889-101 over
R temperature switch.
- R (g) Install new 12100CL8 seal and 741801-103
R temperature sequence switch.
- R (h) Install 613A51-0007-1 seal and 673872-103
R temperature sensor with AN960C416L washers and
R LH7875-4 nuts.
- R (i) Install 801A50-0003B seal, R45116T-0403 adapter
R and 1550342-129 tube assembly.
- R (j) Install 672274-123 ejector.
- R (4) Install RB211-524B-02 engine equipped QEC unit (Ref. MM
R 71-00-03).
- R (5) Package, tag and store all removed parts with
R reconversion kit for subsequent reconversion.
- R (6) Ensure engine designation placard on pilots center
R instrument panel indicates correct engine/duct
R combination and position (Ref. MM 11-32-10).
- R (7) Make appropriate entry in aircraft log book.
- R (8) Consult Airplane Flight Manual and Weight and Balance
R Manual for specific configuration operating
R limitations.

EFFECTIVITY: 032, 033

71-00-06

Page 407
Feb 15/82



MAINTENANCE MANUAL

B. Reconversion from RB211-524B-02 Engine to RB211-22B-02 Engine

- (1) Remove RB211-524B-02 engine equipped QEC unit (Ref. MM 71-00-03).
- (2) Remove 1607515-101 glove fairing assembly and install 1544137-101 glove fairing assembly (Ref. MM 54-52-53 and IPC 54-52-04 and Fig. 402):
- (3) On 1618204-101 bleed air system, proceed as follows (Ref. MM 36-11-11, IPC 36-11-06 and Fig. 402):
 - (a) Remove 672274-123 ejector.
 - (b) Remove 1550342-129 tube assembly, R45116T-0403 adapter and 801A50-0003B seal.
 - (c) Remove LH7875-4 nuts, AN960C416 washers, 673872-103 temperature sensor and 613A51-0007-1 seal.
 - (d) Remove 741801-103 temperature sequence switch and 12100CL8 seal.
 - (e) Remove 741889-101 over temperature switch and 12100CL8 seal.
 - (f) Install new 12100CL8 seal and 740895-103 over temperature switch.
 - (g) Install new 12100CL8 seal and 741592-101 temperature sequence switch.
 - (h) Install 613A51-0007-1 seal and 672496-109 temperature sensor with AN960C416 washers and LH7875-4 nuts.
 - (i) Install 12100CL4 seal, R45116P-0604 adapter and 1550342-113 tube assembly.
 - (j) Install 672274-115 ejector.
- (4) Install RB211-22B-02 engine equipped QEC unit (Ref. MM 71-00-03).
- (5) Package, tag and store all removed parts with reconversion kit for subsequent reconversion.
- (6) Ensure engine designation placard on pilots center instrument panel indicates correct engine/duct combination and position (Ref. MM 11-32-10).

EFFECTIVITY: 032, 033

71-00-06

Page 408
Feb 15/82



MAINTENANCE MANUAL

- R (7) Make appropriate entry in aircraft log book.
- R (8) Consult Airplane Flight Manual and Weight and Balance
R Manual for specific configuration operating
R limitations.
- R 6. Conversion/Reconversion of Engine Instruments
- R A. Conversion from RB211-22B-02 Engine to RB211-524B-02 Engine
- R (1) On FE/SO instrument panel proceed as follows:
- R (a) Remove 8DJ176LXW1 N2 indicator and install
R 8DJ176LXZ1 N2 indicator (Ref. MM 77-12-06).
- R (b) Remove 8DJ177LWR1 oil temp. indicator and install
R 8DJ177LWV1 (Ref. MM 77-34-02).
- R B. Recversion from RB211-524B-02 Engine to RB211-22B-02
R Engine
- R (1) On the FE/SO instrument panel proceed as follows:
- R (a) Remove 8DJ176LXZ1 N2 indicator and install
R 8DJ176LXW1 N2 indicator (Ref. MM 77-12-06).
- R (b) Remove 8DJ177LWV1 oil temperature indicator and
R install 8DJ177LWR1 oil temperature indicator (Ref.
R MM 79-34-02).

LOCKHEED
MAINTENANCE MANUAL

RB211-22B-02		RB211-524B-02		IPC REFERENCE
DESCRIPTION	PART NUMBER	DESCRIPTION	PART NUMBER	
ENGINE NO. 1 ENGINE NO. 2 ENGINE NO. 3 INTEGRATED DRIVE GENERATOR PACKING PACKING STARTER PACKING HYDRAULIC PUMP PACKING STARTER VALVE NO. 1 AND NO. 3 ENGINE POSITIONS GLOVE FAIRING ASSEMBLY DOOR ASSEMBLY SCREW CLIP BOLT WASHER E21 INLET ANTI-ICE DUCT STARTER DUCT	LJ16559 (671472-275) LJ27702 (671472-313) LJ16579 (671472-279) 729640 M33248/1-137 M33248/1-270 763549-2 M33248/1-216 350880-7 (2 EA. ON ENGINE NO. 2) LS15794-216 753582-1 1607740-115 1608671-101 AND -102 NAS5703U10 (14) 1608678-101 AND -102 NAS5108U3 (4) AN960010 (4) LJ21745 LJ22155 LJ17325 AND LJ17326 1505281-109 1507119-101 NAS5804U13 (12)	ENGINE NO. 1 ENGINE NO. 2 ENGINE NO. 3 INTEGRATED DRIVE GENERATOR PACKING PACKING STARTER PACKING HYDRAULIC PUMP PACKING STARTER VALVE NO. 1 AND NO. 3 ENGINE POSITIONS GLOVE FAIRING ASSEMBLY DOOR ASSEMBLY BOLT E21 INLET ANTI-ICE DUCT STARTER DUCT G8 INLET ANTI-ICE DUCT STARTER DUCT FORWARD PYLON FAIRINGS PANEL (USED WITH E21 INLET) SCREW FORWARD PYLON FAIRINGS PANEL (USED WITH G8 INLET) SCREW FAIRING BOLT BOLT WASHER BRACKET ASSEMBLY SCREW	ANY MODEL ANY MODEL ANY MODEL } SAME AS RB211-22B-02 ENGINES 1607740-115 1607741-101 AND -102 NAS4503U13 (14) LJ21745 LJ22155 LJ17325 AND LJ17326 LJ28097 LJ28092 LJ26637 AND LJ26661 1505281-109 1507119-101 NAS5804U13 (12) 1505281-143 1608873-101 NAS5704U9 (12) 1608876-103 NAS5704U11 (2) NAS6204-4 (4) AN9600416 (4) 1608877-107 NAS5204U9 (4)	71-00-00 71-00-00 71-00-00 } NOT APPLICABLE 54-51-02 54-51-02 } NOT APPLICABLE 71-11-03 80-11-09 80-11-09 71-11-03 80-11-09 80-11-09 54-51-01 54-51-01 NOT APPLICABLE 54-51-01 54-51-01 NOT APPLICABLE 54-51-01 } NOT APPLICABLE 71-00-00 NOT APPLICABLE

NOTE
AIRCRAFT PART DIFFERENCES WHEN UTILIZING CONVERSION/RECONVERSION

M11-0000-71-082

Intermix Chart For Conversion/Reconversion
Figure 401 (Sheet 1)

EFFECTIVITY: 032, 033

71-00-06
Page 411/412
Feb 15/82

R
R
R
0128

LOCKHEED
MAINTENANCE MANUAL

RB211-228-02 		RB211-524B-02 		IPC REFERENCE
DESCRIPTION	PART NUMBER	DESCRIPTION	PART NUMBER	
NO. 1 AND NO. 3 ENGINE POSITIONS PYLON BLEED AIR SYSTEM EJECTOR TUBE ASSEMBLY ADAPTER SEAL TEMPERATURE SENSOR SEAL WASHER BOLT NUT TEMPERATURE SEQUENCE SWITCH SEAL OVER TEMPERATURE SWITCH SEAL	1560585-101 672274-115 1545461-113 R45116P-0604 20202CL4 672496-109 613A51-0007-1 AN960C416L (2) NAS6304U11 (2) MS20500-428 (2) 741592-101 12100CL8 740895-103 12100CL8	NO. 1 AND NO. 3 ENGINE POSITIONS PYLON BLEED AIR SYSTEM EJECTOR TUBE ASSEMBLY ADAPTER SEAL TEMPERATURE SENSOR SEAL WASHER BOLT NUT TEMPERATURE SEQUENCE SWITCH SEAL OVER TEMPERATURE SWITCH SEAL	1560585-101 672274-115 1545461-113 R45116P-0604 20202CL4 672496-109 613A51-0007-1 AN960C416L (2) NAS6304U11 (2) MS20500-428 (2) 741592-101 12100CL8 740895-103 12100CL8	36-11-02 AND 36-11-03
NO. 2 ENGINE POSITION GLOVE FAIRING ASSEMBLY PYLON BLEED AIR SYSTEM EJECTOR TUBE ASSEMBLY ADAPTER SEAL TEMPERATURE SENSOR SEAL WASHER NUT TEMPERATURE SEQUENCE SWITCH SEAL OVER TEMPERATURE SWITCH SEAL	1544137-101 1560590-101 672274-115 1550342-113 R45116P-0604 12100CL4 672496-109 613A51-0007-1 AN960C416 LH7875-4 741592-101 12100CL8 740895-103 12100CL8	NO. 2 ENGINE POSITION GLOVE FAIRING ASSEMBLY PYLON BLEED AIR SYSTEM EJECTOR TUBE ASSEMBLY ADAPTER SEAL TEMPERATURE SENSOR SEAL WASHER NUT TEMPERATURE SEQUENCE SWITCH SEAL OVER TEMPERATURE SWITCH SEAL	1607515-101 1618204-101 672274-123 1550342-129 R45116T-0403 801A50-00038 673872-103 613A51-0007-1 AN960C416 LH7875-4 741801-103 12100CL8 741889-101 12100CL8	36-11-02 NOT APPLICABLE 54-52-04 36-11-06 NOT APPLICABLE 77-12-05 79-34-02
ENGINE INSTRUMENTS N2 INDICATOR OIL TEMPERATURE INDICATOR	80J176LXW1 80J177LWR1	ENGINE INSTRUMENTS N2 INDICATOR OIL TEMPERATURE INDICATOR	80J176LXZ1 80J177LWV1	

 **NOTE:**
AIRCRAFT PART DIFFERENCES WHEN UTILIZING ENGINE CONVERSION/RECONVERSION

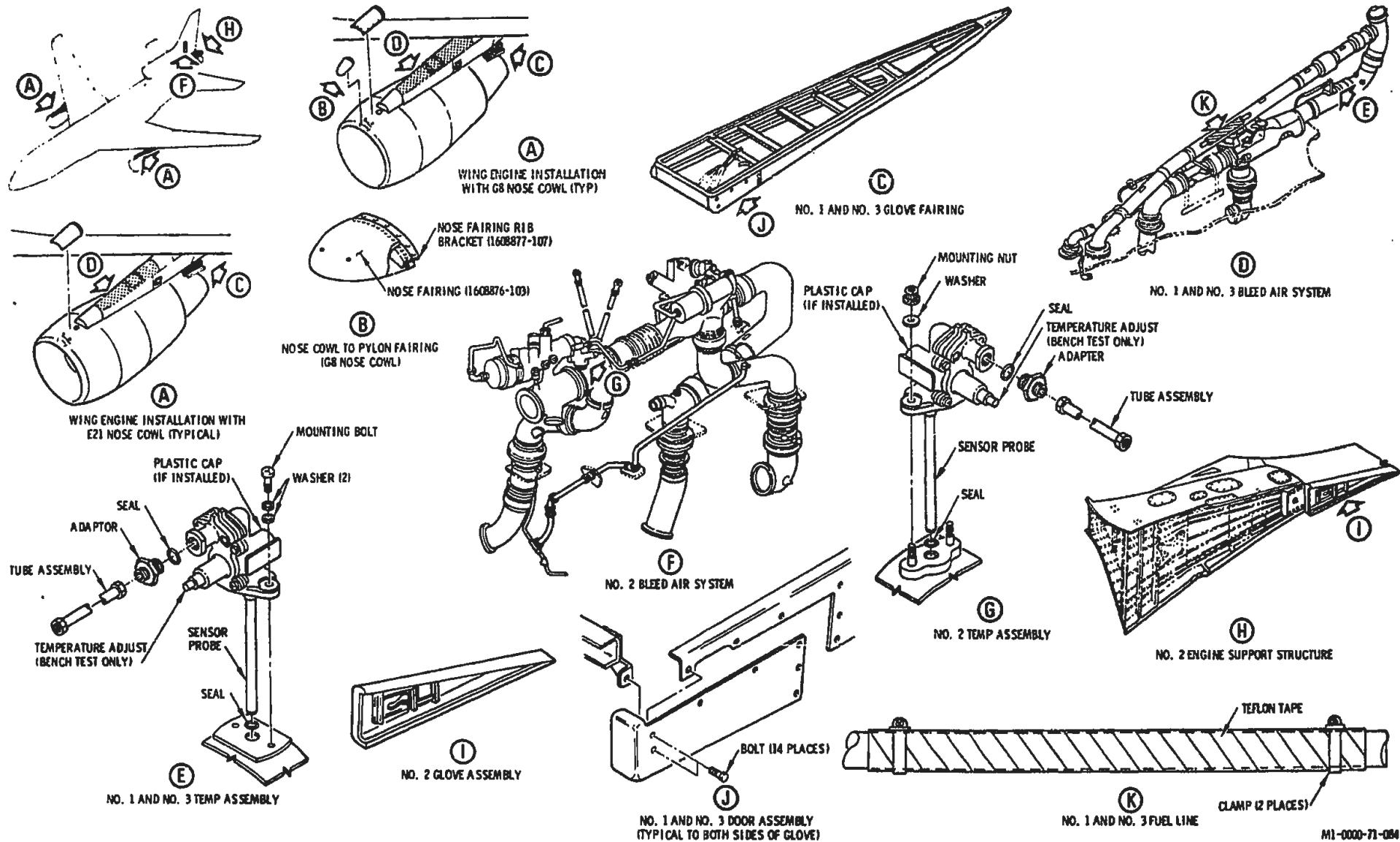
M1-0000-71-083

R
R Intermix Chart For Conversion/Reconversion
Figure 401 (Sheet 2)

R
R EFFECTIVITY: 032, 033

012B

71-00-06
Page 413/414
Feb 15/82



M1-0000-71-084

RB211-22B-02/RB211-524B-02 Conversion/Reconversion
Figure 402

EFFECTIVITY: 032, 033

71-00-06
Page 415/416
Feb 15/82

R
R
R
0128



RB.211 Propulsion System

MAINTENANCE

COWLING, ENGINES NO.1 AND NO.3 - DESCRIPTION AND OPERATION

1. General

The No.1 and No.3 (wing mounted) engines are enclosed by removable cowling (Ref. fig.1), comprising left and right-hand hinged cowls, a hinged cowl support structure and a combined nose cowl and air intake assembly.

The hinged cowls and nose cowl assembly incorporate access panels (Ref. 6-40-00) to facilitate maintenance, and blow-out doors to cater for excess pressure. Fire fighting access panels are located in the hinged cowls. Each panel is labelled to identify its individual function.

Acoustic materials, incorporated in cowling construction, assist in engine noise reduction.

Service Bulletins referred to:

- S.B.71-2175 - L.H. and R.H. hinged cowl retention feature.
- S.B.71-2837 - Starter access door with pressure relief facility deleted.
- S.B.71-2721 - Blanking of vent tube hole and revised fire detector jumper lead.
- S.B.71-3843 - R.H. cowl side panel - Oil collector.
- S.B.71-2660 - Zone 1 cooling air discharge nozzle.
- S.B.30-2178 - Introduction of overboard vent duct.
- S.B.71-2836 - Introduction of engine oil service light.
- S.B.78-2280 - Addition of identification markings.
- S.B.71-3097 - Interphone receptacle repositioned.
- S.B.71-5450 - Introduction of hinged cowls constructed of carbon fibre composite material.

R
R

EFFECTIVITY: ALL

050B

1J

71-11-00

Page 1
Nov 15/81



RB.211 Propulsion System

MAINTENANCE

2. Description

A. Left-hand and Right-hand Hinged Cowls

The L.H. and R.H. removable hinged cowls (Ref. fig.1), zone 413, 423 and 414, 424, extend rearward from the nose cowl to the engine firewall (Ref. 71-30-01). They provide access to the engine accessories on the L.P. compressor case. Each cowl is supported by four hinge brackets (Ref. fig.3) that locate in a common support structure. When closed the hinged cowls meet along the bottom centre line of the engine and are interconnected by four hook-type latches on the L.H. cowl and four corresponding 'U' bolts on the R.H. cowl; the abutment faces being dowel located. An extending pin type safety latch, fitted in the lower leading edge position on each cowl, engages a bracket on the nose cowl rear diaphragm.

The cowls are located and sealed circumferentially on lands integral with the nose cowl and engine firewall. A longitudinal seal attached to the upper edge of each cowl seals the cowl with the support structure.

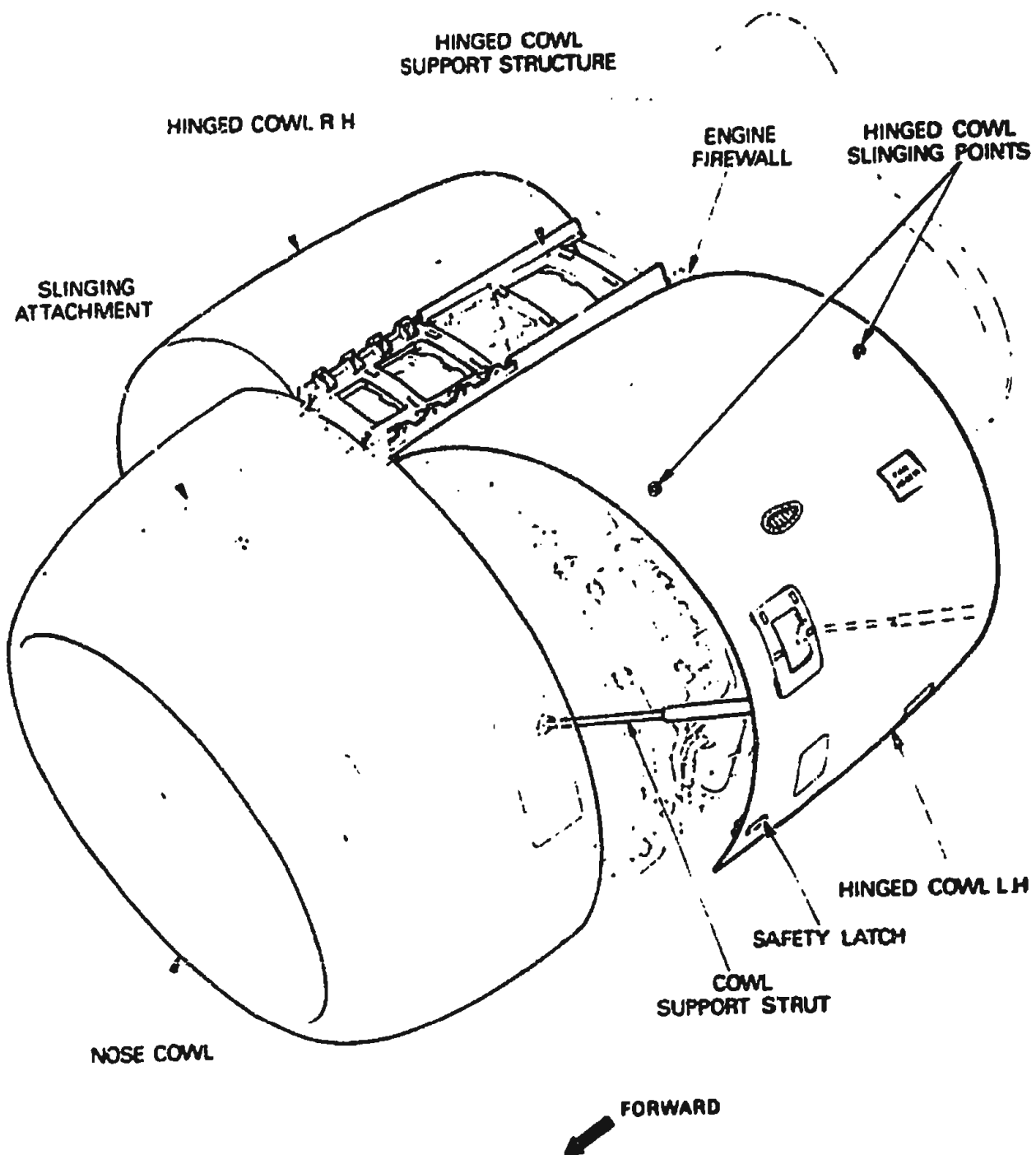
Each cowl is held open by two telescopic struts, mounted on swivel joints. Twist-type friction locks permit extension of the struts to provide maximum cowl opening. The strut folds down on the inside of the cowl for stowage. On engines incorporating S.B.71-2175, a lanyard assembly (Ref. fig.3), between support structure and cowl hinge brackets at the outer hinge positions, prevents over-opening, and consequent disengagement, of the cowl.

Doors and panels located in the L.H. cowl provide access to the engine oil tank filler, integrated drive generator (I.D.G.) sight glass, and fire fighting access. The oil filler access door incorporates an over-pressure blow-out panel and the fire fighting access door also embodies an over-pressure blow-out facility. A spring loaded access door to the starter oil filter connector, incorporates a starter exhaust door through which excess pressure is relieved during starter operation. This facility is deleted on engines incorporating S.B.71-2837. The L.H. cowl also includes an outlet duct for the engine gearbox breather.



RB.211 Propulsion System

MAINTENANCE



25515A

Cowling arrangement No.1 and No.3 engines
Fig.1

EFFECTIVITY: ALL

0508

1G

71-11-00

Page 3

May 15/77



RB.211 Propulsion System

MAINTENANCE

A panel in the R.H. cowl provides for access to the starter air valve, and a combined fire fighting access and pressure blow-out door is also incorporated. The R.H. cowl also includes the zone 1 ventilation duct (Ref. 75-21-00) and the fuel drains tank vent. The drains tank vent is deleted on engines incorporating S.B.71-2721. On engines incorporating S.B.71-2843, an oil collector is fitted inside the R.H. cowl, at the lower forward position. The collector receives overspill oil from the gravity oil filler and directs it overboard.

Each cowl is removable, this is achieved by opening the cowl until the hinge brackets disengage from the rollers on the support structure (Ref. fig.3). On engines incorporating S.B.71-2175, the lanyard assemblies must first be disconnected. Two slinging attachments are provided on each panel and are located at the appropriate centre of gravity position with the panel in the removal attitude.

The cowls are 'handed' and, on wing engines, cowls of a similar hand are interchangeable.

R On engines with S.B.71-5450, the cowls are manufactured in
R carbon fibre composite material.

B. Nose Cowl

The nose cowl (Ref. fig.2), zone 411 and 421, is secured to the front flange of the L.P. compressor case. The cowl comprises inner and outer skins supported by front and rear diaphragms. The inner skin forms the engine air inlet and is lined between front and rear diaphragms by noise attenuating materials. Nose cowls are interchangeable between No.1 and No.3 engines.

The rear diaphragm forms the front wall of the engine accessories compartment. The nose cowl inner skin extends rearward beyond the rear diaphragm, terminating in the nose cowl attachment flange. A flange around the outer rear edge of the diaphragm forms the forward sealing land for the hinged cowls. Brackets on either side of the top centre position on the rear diaphragm provide attachment for the front support brackets of the hinged cowl support structure. The lower section of the diaphragm is dished forward to clear the starter duct, and on the outer edges of this section are two housings in which the hinged cowl safety latches locate.

EFFECTIVITY: ALL

050B

1J

71-11-00

Page 4
Nov 15/81



RB.211 Propulsion System

MAINTENANCE

An air inlet, flush with the nose cowl outer skin, feeds air, via an electrically operated shut-off valve, to a manifold integral with the front face of the rear diaphragm, from where it is distributed through two holes for the accessory cooling system (Ref. 75-21-00). On engines incorporating S.B.71-2660, a fish-tailed nozzle fitted to the upper outlet directs the air over the top and down the right-hand side of the zone.

The nose cowl also houses the engine inlet anti-ice system (Ref. 30-21-00); the air distributor ring of this system being housed in the lip section of the cowl and the pneumatic relief valve located on the rear face of the front diaphragm, at the lower right-hand position. On engines incorporating S.B.30-2178, a duct is routed from the outlet of the relief valve to a louvred outlet on the outer skin of the cowl. Housed between the inner and outer skin at the lower left-hand side of the nose cowl, are the two bottles of the fire extinguishing system (Ref. 26-21-00). Both bottles are connected by a common delivery tube to a multi-spray discharge nozzle, secured to the top centre position on the rear diaphragm. Doors in the outer skin provide access to the bottles and two transparent discs integral with the doors provide visual indication of pressure within each bottle. A common thermal discharged indicator is situated adjacent to the access doors.

A probe secured to the inner skin of the cowl protrudes into the air intake and senses air inlet pressure P1 (Ref. 73-21-00). It is connected by an air tube to an adapter on the rear diaphragm and is protected against ice formation by air tapped from the anti-icing system.

A drain tube (Ref. 71-70-00), from the pylon interface, is routed down the left-hand side of the rear diaphragm, to drain overboard through the nose cowl outer skin.

A seal housing on the right-hand side of the rear diaphragm houses the anti-icing air supply duct connector. Electrical connectors located at approximately left centre position on the diaphragm provide disconnect points for electrical harness (Ref. 71-50-00) serving anti-icing, interphone and essential services. The fire bottle harness is fed through the diaphragm and routed up the rear face to disconnect at the engine/aircraft interface.

EFFECTIVITY: ALL

050B

16

71-11-00

Page 5
May 15/77



RB.211 Propulsion System

MAINTENANCE

On engines incorporating S.B.71-2836, on oil service light is located just below the left centre position on the rear diaphragm.

At the top centre position on the nose cowl, a fairing, integral with the outer skin of the lip section (fig.1), provides the leading edge and location for the front removable section of the pylon fairing. Secured to the nose cowl, behind the nose section fairing, are the slinging attachments for removal/installation of the nose cowl assembly. On units incorporating S.B.78-2280, the slinging lugs are identified relative to engine position.

C. Hinged Cowl Support Structure

The hinged cowl support structure (Ref. fig.3) bridges the L.P. compressor case at the top centre position, between the nose cowl and engine firewall, and provides attachment for the hinged cowls. The structure comprises two longitudinal beams, joined together by four cross members, spaced to suit the position of the cowl hinge brackets, and incorporating roller assemblies between which the hinge brackets slide. The spaces between cross members provide access to the engine front mount and the pylon floor, and also for the passage of certain tubes and cables of the engine services.

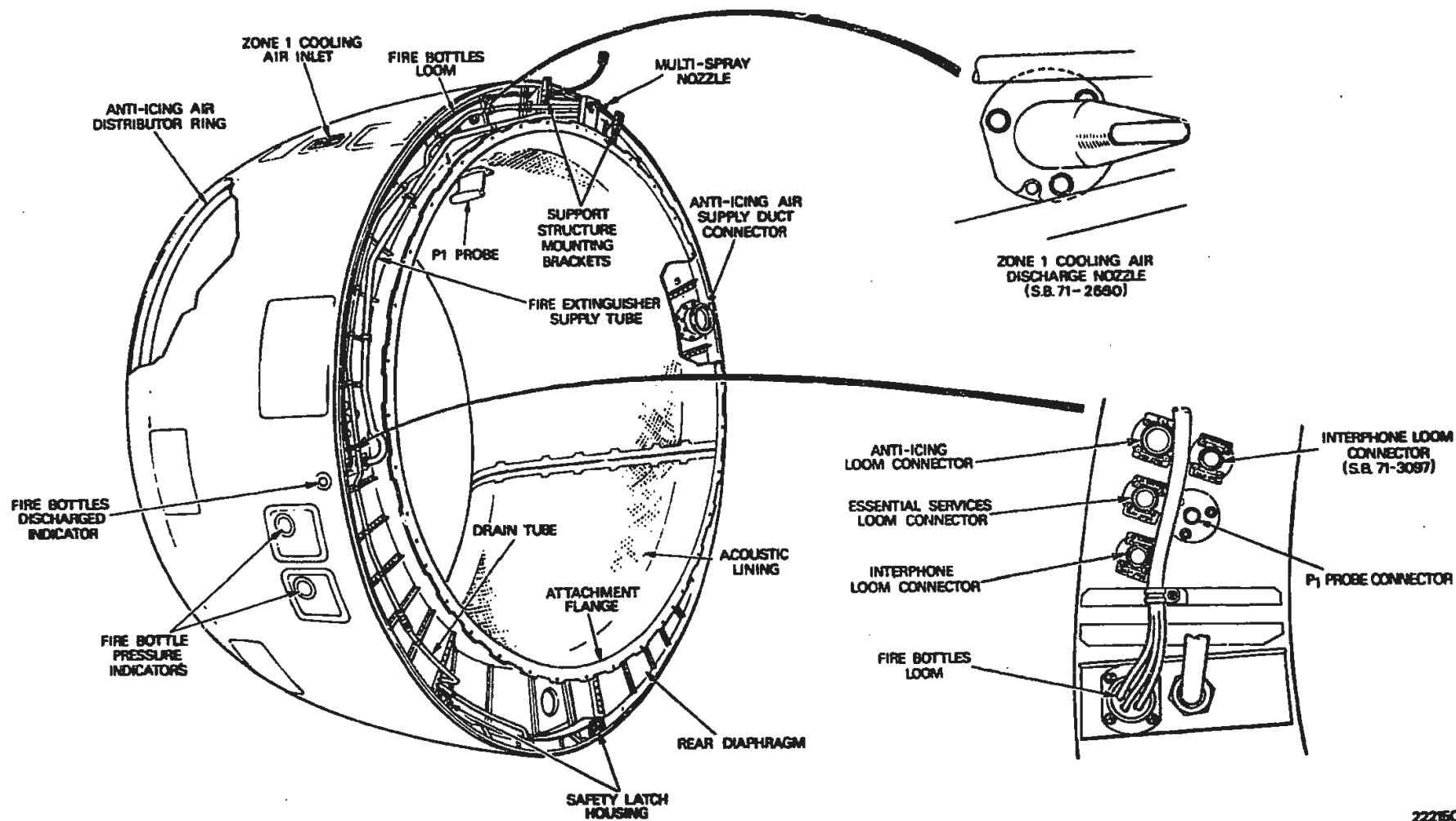
The front end of the support structure is attached by two support brackets and quick-release pip pins to brackets secured to the rear diaphragm of the nose cowl. At the rear, attachment is by two support brackets and quick-release pip pins that engage mounting brackets secured to the front face of the engine firewall.

A fire control seal secured to the top face of each longitudinal beam seals the structure to the underside of the pylon floor. Four support cables, attached to the support structure and pylon floor, support the structure when it is disengaged from its front and rear attachments during engine removal.



RB.211 Propulsion System

MAINTENANCE



Nose cowl
Fig.2

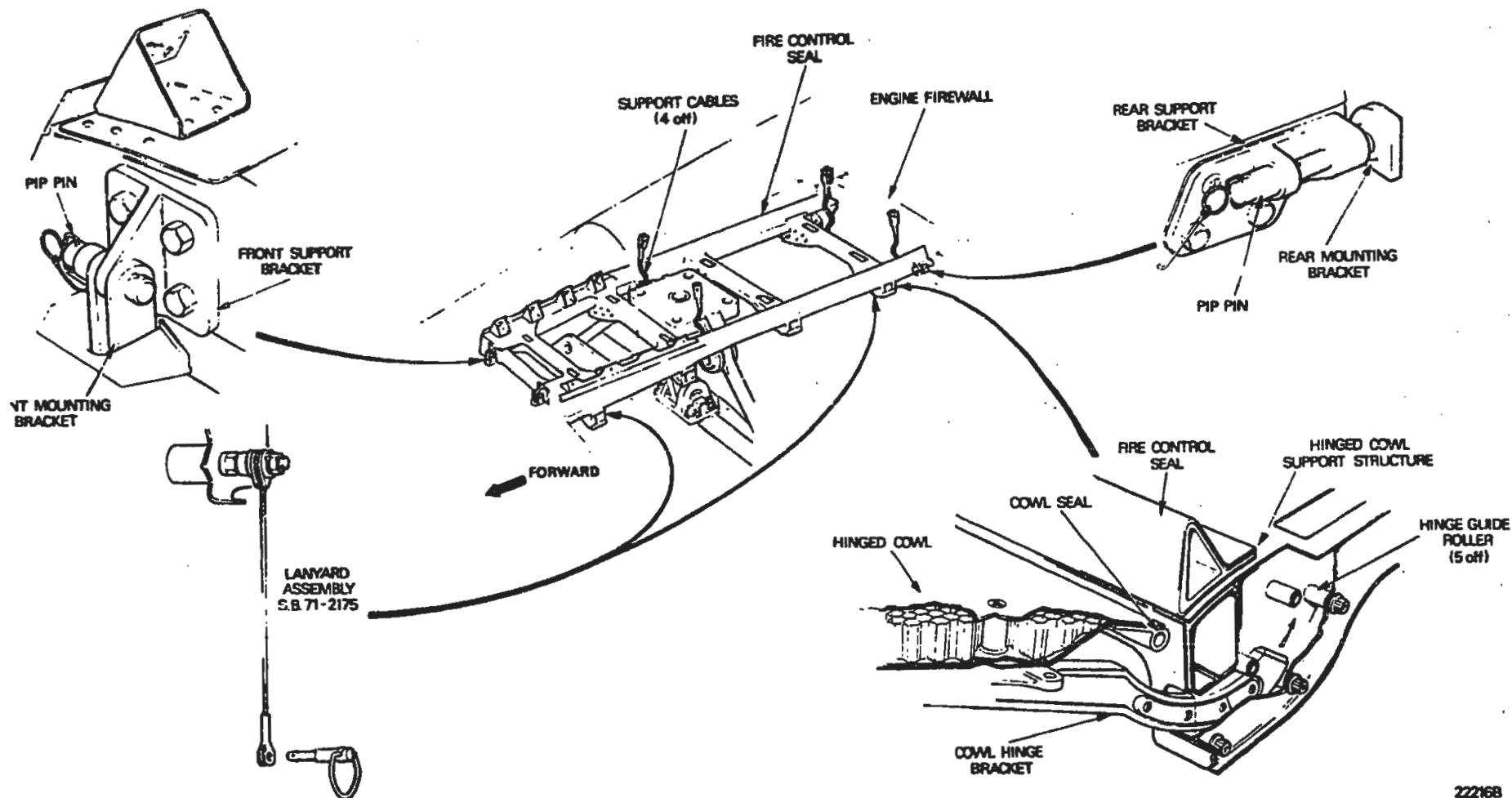
22216C

EFFECTIVITY: ALL

71-11-00
Page 7/8
May 15/77



RB.211 Propulsion System MAINTENANCE



222168

Hinged cowl support structure
Fig.3

EFFECTIVITY: ALL

050B

1G

71-11-00
Page 9/10
May 15/77



RB.211 Propulsion System

MAINTENANCE

COWLING, ENGINES NO.1 AND NO.3 - SERVICING

1. Open and Close Hinged Cowls

- WARNING:**
1. WHEN OPENING HINGED COWLS, DO NOT OPEN COWL WIDER THAN IS NECESSARY TO ENGAGE THE EXTENDED SUPPORT STRUTS IN THE APPROPRIATE ANCHORAGE BRACKET.
 2. SPECIAL CARE MUST BE EXERCISED WHEN OPENING HINGED COWLS IN WIND SPEEDS EXCEEDING 30 M.P.H. (26 KT.).
 3. HINGED COWLS MUST NOT REMAIN OPEN OR BE OPENED IN WIND SPEEDS EXCEEDING 60 M.P.H. (52 KT.).

The following procedure applies when opening or closing either left-hand, or right-hand hinged cowls.

A. Open Hinged Cowl

- (1) Refer to fig.301, unlock and withdraw safety latch (1).
- (2) Unlock and disengage latches (2), in sequence from front to rear.
- (3) Open hinged cowl.
- (4) Hold hinged cowl open from inside. Remove pip pin (3), on strut (A), to release strut from stowage bracket (4).
- (5) Check satisfactory operation of locking head (6)
 - (a) Move locking collar (5), on strut (A) in direction of arrow and ensure locking head pin retracts. Release locking collar and ensure pin extends
- (6) Extend strut until it automatically locks in fully extend position.

R

R
R
R

EFFECTIVITY: ALL

050B

1A

71-11-00
Page 301
May 15/88



RB.211 Propulsion System

MAINTENANCE

- (7) Move locking collar (5), on strut (A), in direction of arrow and engage locking head (6) in strut anchorage bracket (7). Release locking collar (5) to lock strut to anchorage bracket.

NOTE: Anchorage bracket (7) for strut (A) is located on nose cowl rear flange and anchorage bracket for strut (B) is located on the engine firewall.

- (8) Repeat operations (4) to (7) for strut (B).
- (9) **WARNING:** IT IS ESSENTIAL THAT BOTH SUPPORT STRUTS ARE SECURED AND LOCKED WHEN THE HINGED COWL IS OPEN.
Ensure that support struts are secure and locked, then release hinged cowl.

B. Close Hinged Cowl

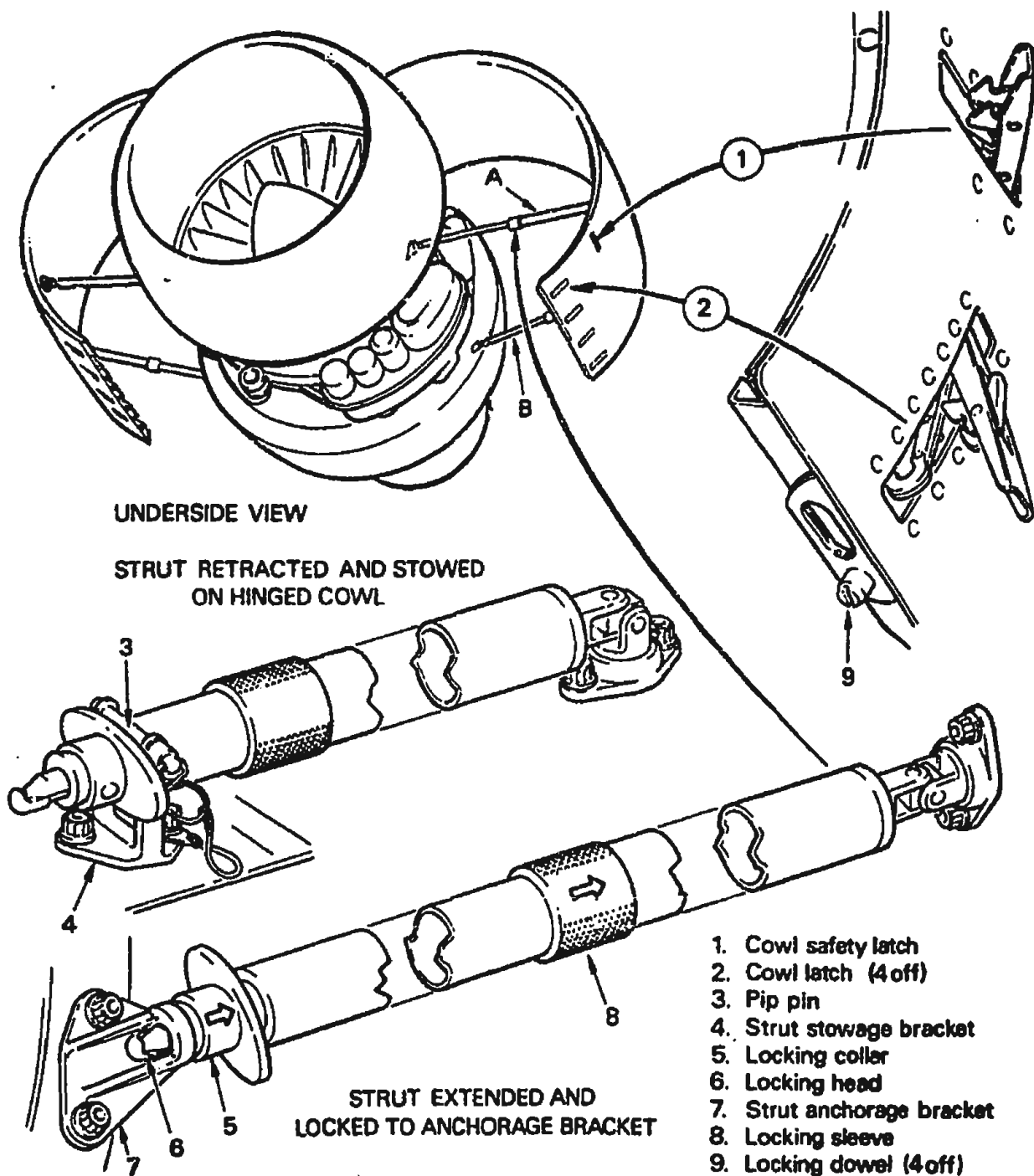
- (1) Support hinged cowl from inside.
- (2) Refer to fig.301, move locking collar (5), on strut (A), in direction of arrow to disengage locking head (6) from strut anchorage bracket (7).
- (3) Move locking sleeve (8), on strut (A), in direction of arrow to unlock strut. Retract strut to stowage length.
- (4) **CAUTION:** FAILURE TO ENSURE STRUT IS CORRECTLY POSITIONED AND LOCKED IN STRUT STOWAGE BRACKET CAN CAUSE ENGINE CONTROL FOULING, WHICH COULD RESULT IN ENGINE SHUTDOWN.
Locate strut in stowage bracket (4); enter pip pin (3) in stowage bracket to secure strut, ensuring pin is located in circumferential groove adjacent to strut end, extending strut slightly if necessary, to achieve this.
- (5) Repeat operations (1) to (4) for strut (B).
- (6) Ensure that struts are secure and locked in stowage position.
- (7) Carefully lower hinged cowl.

NOTE: When closing hinged cowls ensure that locating dowels (9) in the abutment face are correctly engaged in their locating holes.



RB.211 Propulsion System

MAINTENANCE



37031A

R
R

Hinged cowls opening
Fig.301

EFFECTIVITY: ALL

050B

1A

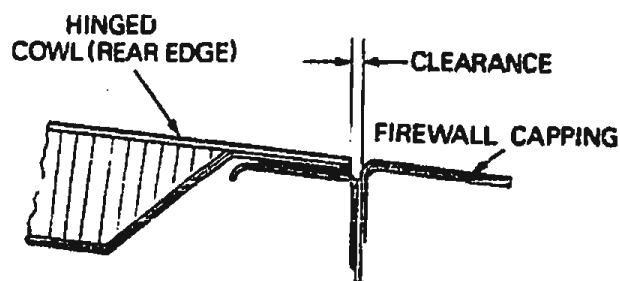
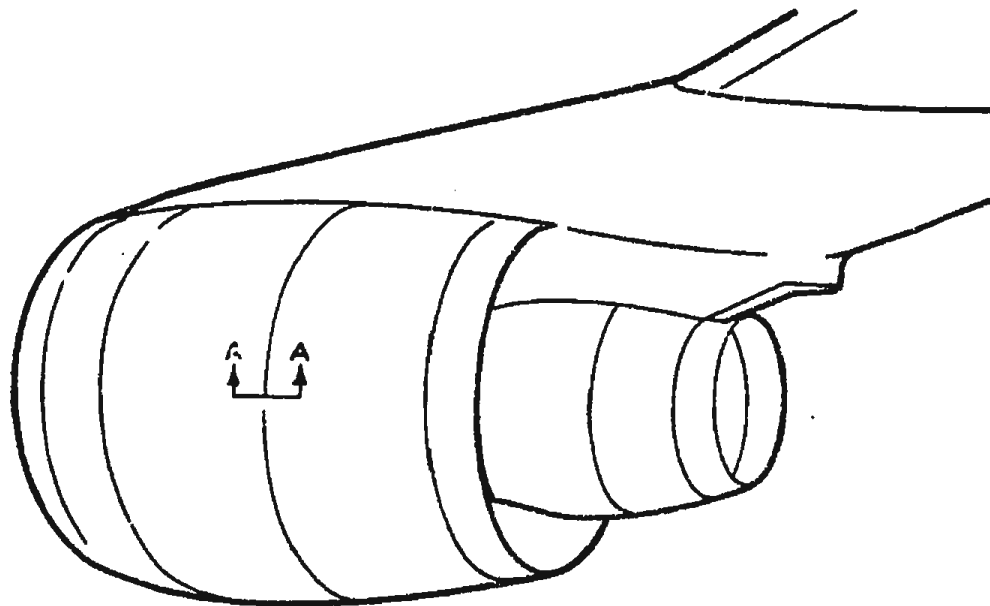
71-11-00

Page 303
Mar 15/83



RB.211 Propulsion System

MAINTENANCE



SECTION A-A

37032

R
R

Hinged cowl clearance check
Fig.302

EFFECTIVITY: ALL

050B

16

71-11-00
Page 304
May 15/77

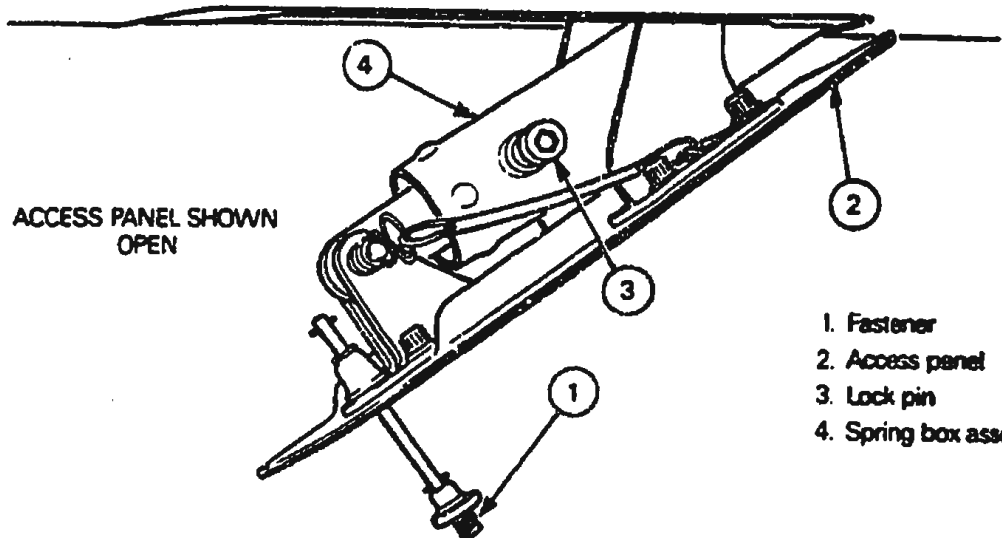


RB.211 Propulsion System MAINTENANCE

A

LEFT-HAND HINGED COWL

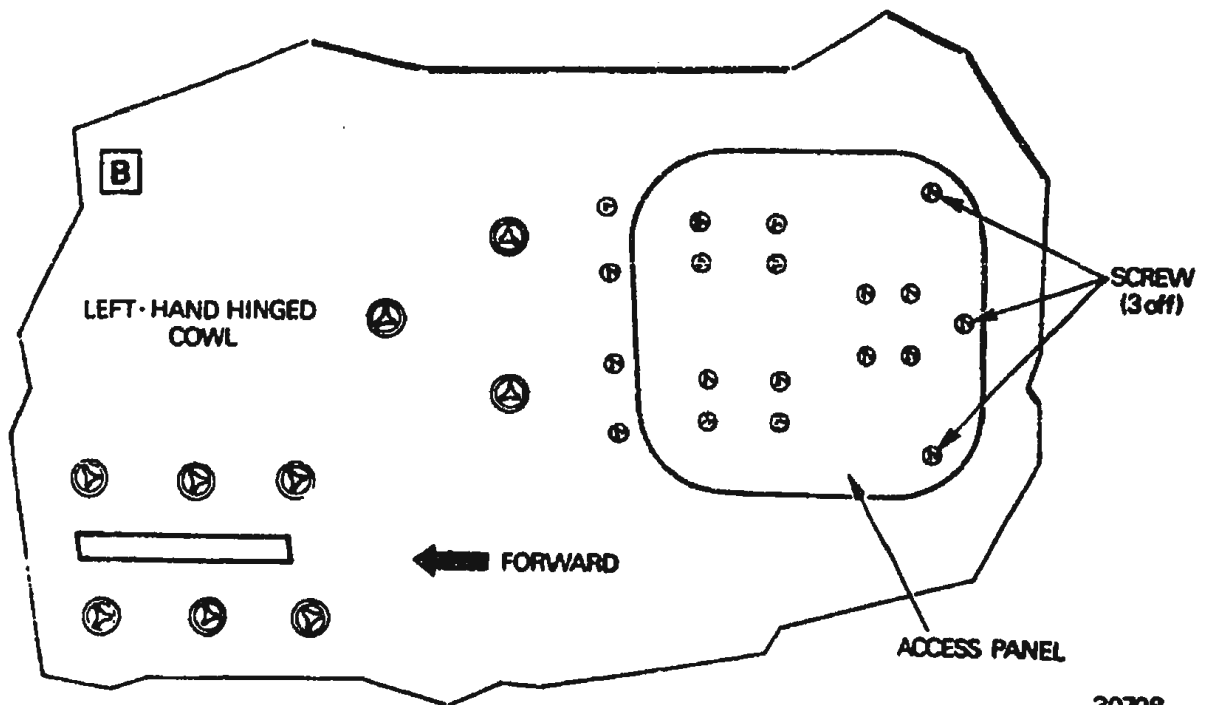
FORWARD



- 1. Fastener
- 2. Access panel
- 3. Lock pin
- 4. Spring box assembly

B

LEFT-HAND HINGED COWL



SCREW
(3 off)

ACCESS PANEL

30708

Starter oil pressure filler access panel opening
Fig.303

EFFECTIVITY: ALL

050B

16

71-11-00
Page 305
May 15/77



RB.211 Propulsion System

MAINTENANCE

- (8) Engage and secure latches (2), in sequence from front to rear.
- (9) Engage and secure safety latch (1).
- (10) Refer to fig.302, check clearance between hinged cowl rear edge and firewall capping is 0.050 to 0.250in. (1,27 to 6,35 mm.). If clearance is achieved proceed with operation (11). If clearance is not achieved proceed with operation (12).

NOTE: Hinged cowl must not be pushed forward to achieve this clearance.

- (11) Check that hinged cowls are secure and all latches correctly engaged and locked.
- (12) Clearance is not achieved.
 - (a) Remove hinged cowl (Ref. 71-11-01/02, Removal/Installation).
 - (b) Repair in accordance with FRS.1031 (Ref. Approved Repairs).
 - (c) Install hinged cowl (Ref. 71-11-01/02, Removal/Installation).

2. Open and Close Starter Oil Pressure Filler Access Panel

Service Bulletins referred to:

S.B.71-2837 - Exhaust Relief Door with Pressure Relief Features Deleted.

S.B.71-3129 - Starter Access Door Simplified Construction

The following procedure applies when opening or closing access panel 413C or 423C.

- A. Open Access Panel - Engines not incorporating S.B.71-2837
 - (1) Refer to A, fig.303, release fastener (1).
 - (2) Using fastener (1) open access panel (2).

R EFFECTIVITY: ALL

050B

71-11-00

Page 306
May 15/88

1A



BB.211 Propulsion System

MAINTENANCE

- (3) **WARNING:** THE SPRING BOX ASSEMBLY (4) IS PRE-LOADED TO THE CLOSED POSITION. THEREFORE CARE MUST BE EXERCISED WHEN LOCKING THE ACCESS PANEL IN THE OPEN POSITION.

Hold access panel (2) in open position. Press and hold lock pin (3) then close panel until lock pin held in.

B. Close Access Panel - Engines not incorporating S.B.71-2837

- (1) Refer to A, fig.303, using fastener (1) ease access panel (2) fully open and ensure lock pin (3) springs out to unlock spring box assembly (4).

- (2) Carefully close access panel (2) then secure fastener (1).

C. Open/Close Access Panel - Engines incorporating S.B.71-2837

- (1) Refer to B, fig.303, remove screws (3 off) then open access panel.

- (2) Close access panel then fit and secure screws (3 off).

D. Open/Close Access Panel - Engines incorporating S.B.71-3129

- (1) Release latches (2 off) and remove access panel.

- (2) Position access panel on aperture in L.H. hinged cowl and secure latches.

EFFECTIVITY: ALL

050B

1A

71-11-00
Page 307/308
May 15/88



BB.211 Propulsion System

MAINTENANCE

COWLING, ENGINE NO.1 AND NO.3 - ADJUSTMENT/TEST

1. Adjust Cowls

A. Adjust Hinged Cowlings

- (1) Refer to fig.501, section AA; with engine cold, test clearance between bottom edges of left-hand hinged cowl and right-hand hinged cowl.
- (2) Fit or remove shims (1) at any of four latch positions to obtain correct clearance.
- (3) Test cowl latch operating load (ref. para.C.), and adjust if necessary (ref. para.B.).

B. Adjust Hinged Cowl Latch Operating Load

- (1) Refer to fig.501, section BB; remove securing nuts (2), U-bolt (3), and tab washers (5).
- (2) Fit new tab washers (5) and refit U-bolt (3).
- (3) Fit securing nuts (2).
- (4) Slacken locknuts (4).
- (5) Slacken or tighten securing nuts (2) in increments of half a turn, testing the cowl latch operating load, (ref. para.C.) at each adjustment until correct load is achieved.

NOTE: Tightening the securing nuts will increase cowl latch operating load, slackening the securing nuts will decrease cowl latch operating load.

- (6) Torque tighten locknuts (4) to 120 lb.in. then bend up tabs of tab washers (5) to lock locknuts.

EFFECTIVITY: ALL

050B

1G

71-11-00

Page 501
May 15/77



RB.211 Propulsion System

MAINTENANCE

C. Test Cowl Latch Operating Load

(1) Equipment required:

HU.20369)
or) Load gauge
HU.21580)

(2) Open appropriate cowl latch to be tested and ensure that adjacent latches are engaged.

(3) Refer to fig.501, Section BB; position load gauge 0.500in. (12.70 mm.) in from free end of latch and apply a load in direction of arrow X.

(4) Check that load to operate cowl latch is 20 to 40 lbf. (89 to 178N).

EFFECTIVITY: ALL

0508

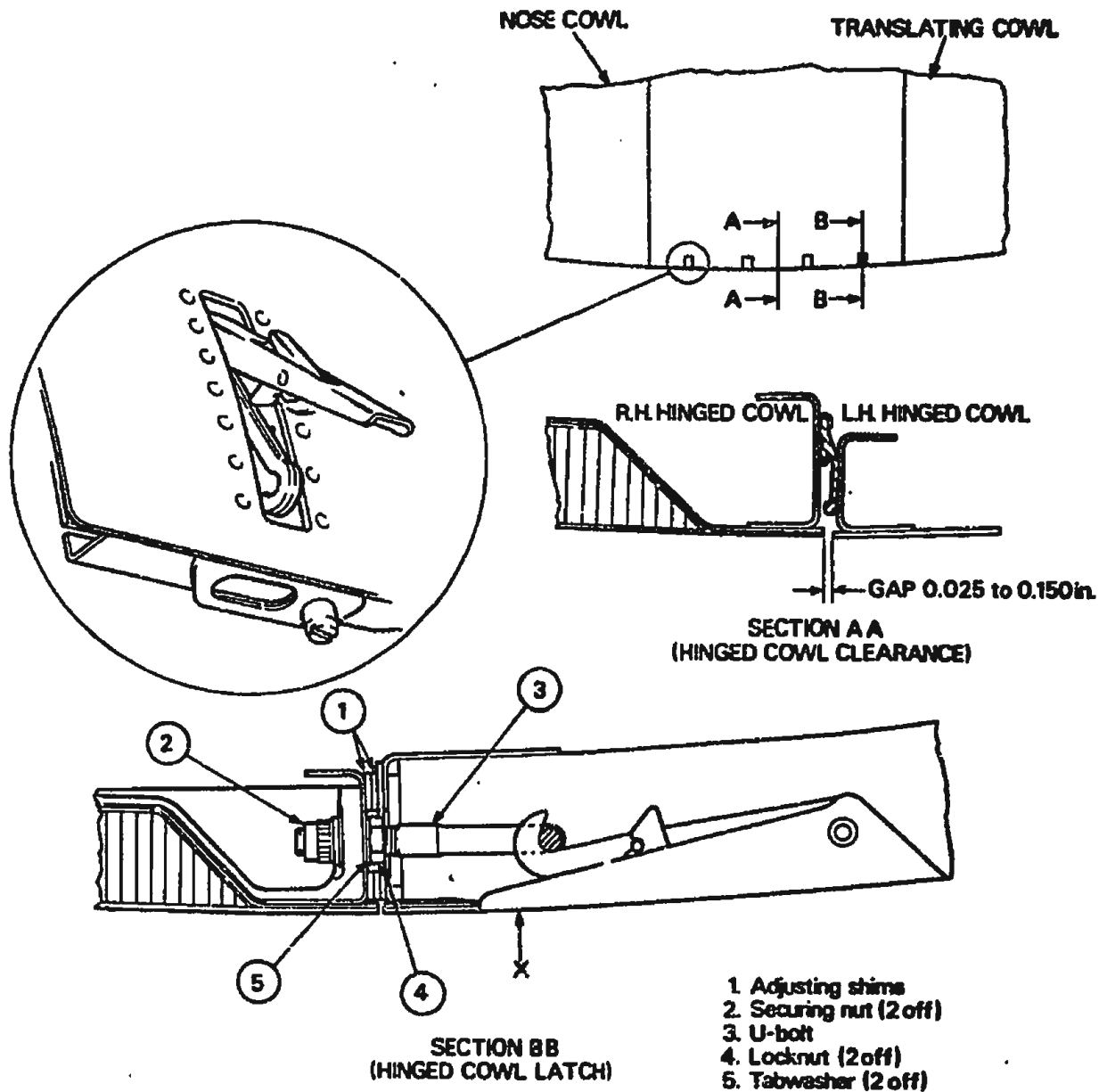
1G

71-11-00
Page 502
May 15/77



RB.211 Propulsion System

MAINTENANCE



26049A

Hinged cowl adjustment
Fig. 501

EFFECTIVITY: ALL



RB.211 Propulsion System

MAINTENANCE

COWLING, ENGINES NO.1 AND NO.3 - APPROVED REPAIRS

REAR EDGE OF HINGED COWL TRIMMED BY 0.075in. (1,905 mm.)

FRS.1031

1. Trim rear edge of hinged cowl

Procedure	Supplementary Information
A. Scribe a line 0.075in. (1,905 mm.) from cowl rear edge extending length of cowl	
B. Remove metal to scribed line	Draw file method recommended as mechanical cutting tools can cause delamination of cowl rear edge
C. Deburr	
D. Clean cowl rear edge	Cold liquid degrease
E. Apply protective treatment to cowl rear edge	Primer - Allocrom 1200 - OMat 175 or Alodine 1200 - OMat 175A Finish - Any approved air drying touch-up paint
F. Vibro-engrave FRS.1031 on cowl identity plate	

EFFECTIVITY: ALL

050B

16

71-11-00
Page 801/802
May 15/77



RB.211 Propulsion System

MAINTENANCE

LEFT-HAND HINGED COWL - REMOVAL/INSTALLATION

CAUTION: CARE MUST BE TAKEN WHEN HANDLING COWLING TO AVOID DAMAGE AS THIS MAY AFFECT THE ACOUSTIC LINING OR INNER CORE. ALL REMOVED COWLINGS AND FAIRINGS MUST BE PLACED ON SUITABLY PROTECTED RACKS.

1. Removal/Installation Left-Hand Hinged Cowl, Zone 413 and 423

WARNING: 1. SPECIAL CARE MUST BE EXERCISED WHEN OPENING THE HINGED COWLS IN WINDS EXCEEDING 30 M.P.H. (26 KT.).

2. HINGED COWLS MUST NOT REMAIN OPEN OR BE OPENED IN WINDS EXCEEDING 60 M.P.H. (52 KT.).

CAUTION: THE METAL CONSTRUCTED HINGED COWLS WEIGH APPROXIMATELY 136 LB. (62 KG.) EACH.

THE COMPOSITE CONSTRUCTED HINGED COWLS WEIGH APPROXIMATELY 100 LBS. (45.4 K.G.).

A. Remove Hinged Cowl

(1) Equipment required:

CP.21537 Sling

(2) Refer to fig.401, remove and retain plug (1).

(3) Release latches (Ref.71-11-00, Servicing) and open hinged cowl.

(4) Fit sling CP.21537 to attachment point (2) and attach a hoist; take weight on hoist.

(5) On cowls incorporating S.B.71-2175 - Cowl panel safety retention features, release the pip pins (3) from the two outer hinge brackets.

(6) Raise hinged cowl sufficiently until hinge brackets (4) detach from roller assemblies (5).

(7) Support cowl and carefully lower to a suitable surface, turning cowl to stand on end.

(8) Remove sling and fit plug (1).

R EFFECTIVITY: ALL

R
050B

71-11-01

Page 401
Dec 15/92

1A



RB.211 Propulsion System

MAINTENANCE

B. Install Hinged Cowl

(1) Equipment required:

CP.21537 Sling

(2) Refer to fig.401, remove and retain (1).

(3) Fit sling CP.21537 to attachment points (2) and attach a hoist.

(4) Support cowl and raise until it can be turned into the required position.

(5) Raise cowl sufficiently until hinge brackets (4) align with roller assemblies (5).

(6) Locate hinge brackets (4) in roller assemblies (5) and lower the cowl, at the same time engaging (4) and (5). S.B. 71-2175 - Cowl panel safety retention features, insert pip pin (3) through cable eyelet, into outer hinge bracket and push fully home.

(7) Carefully lower cowl.

(8) Remove sling and fit plug (1).

(9) Close and secure cowl (Ref.71-11-00, Servicing).

(10) Test clearance between bottom edges of left-hand hinged cowl and right-hand hinge cowl, (Ref. 71-11-00, Adjustment/Test).

(11) Test cowl latch operating load, (Ref. 71-11-00, Adjustment/Test).

R EFFECTIVITY: ALL

050B

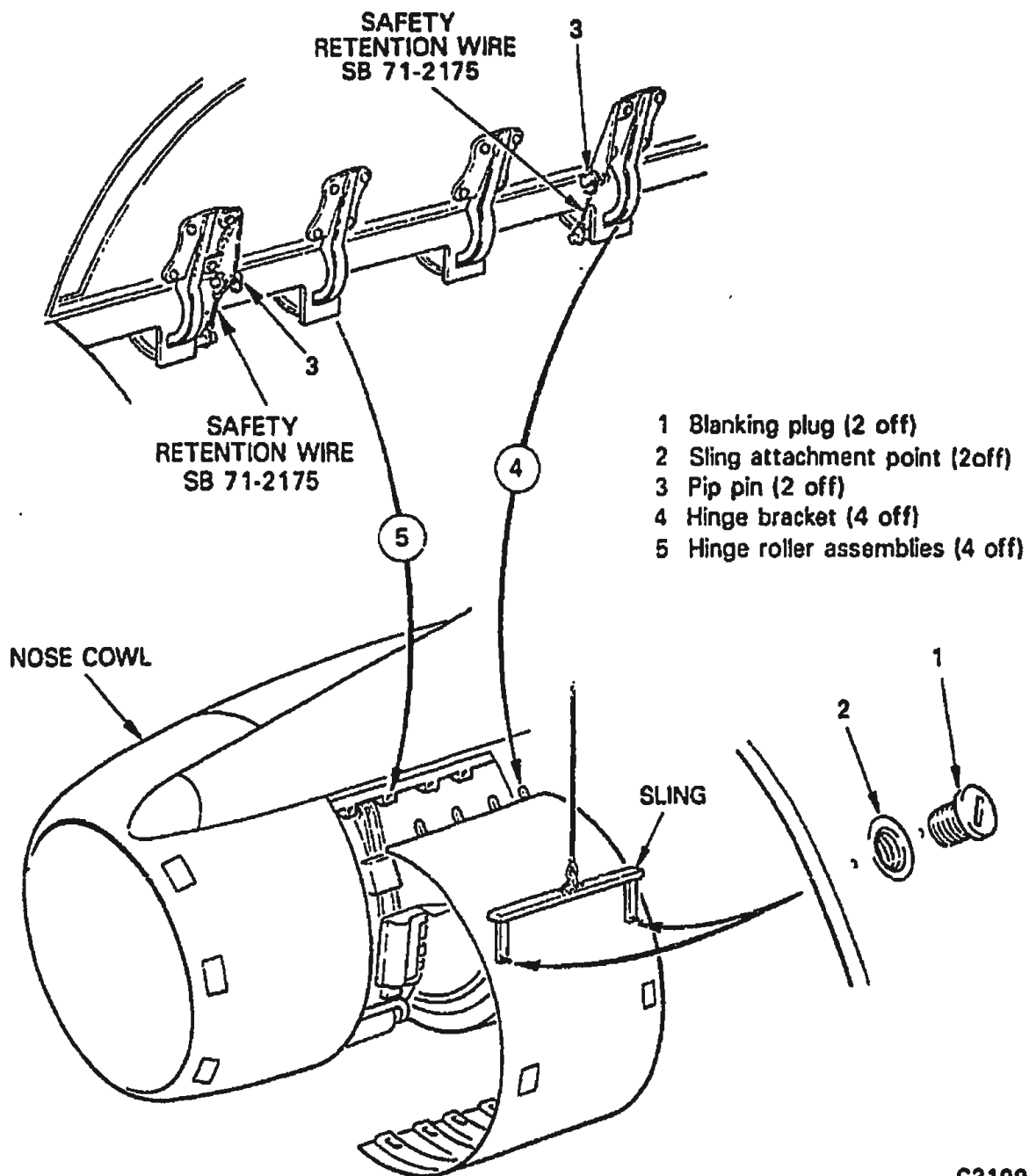
1A

71-11-01
Page 402
Dec 15/92



BB.211 Propulsion System

MAINTENANCE



C3109

CR
CR

Hinged cowl removal/installation
Fig.401

EFFECTIVITY: ALL

050B

1A

71-11-01

Page 403
Dec 15/92



RB.211 Propulsion System

MAINTENANCE

2. Removal/Installation Oil Filler Access Panel Blow out Door

Service Bulletin referred to:

71-5282 Oil filler access blow-out door - additional stiffening features and increased pull off loading.

Referenced Procedures:

71-11-00 Cowling Engine No.1 and No.3 - Servicing
71-11-01 L.H. Hinged Cowl - Adjustment/Test

Illustrated Parts Catalogue References:

The I.P.C. sections where parts disturbed during the following operations can be located, are as follows:

71-11-01 L.H. Hinged Cowl Engines No.1 and No.3

A. Install Blow-out Door

(1) Material required:

	British Spec./Ref.	American Spec./Ref.	OMat Item No.
Degreasing fluid (Inhibited and stabilized 1.1.1 trichloroethane)	BS4487: 1969	MIL-T-81533	1/21

(2) Open left-hand hinged cowl 413A or 423A (Ref. 71-11-00).

(3) Refer to fig.402 (Sheet 1 or 2) examine latch block (1) for damage and/or wear, replace latch block if any damage and/or wear is apparent, as detailed in para.6.

R EFFECTIVITY: ALL

050B

1A

71-11-01

Page 404
Dec 15/92



BB.211 Propulsion System

MAINTENANCE

- (4) **WARNING:** WHEN USING DEGREASING FLUID, ENSURE ADEQUATE VENTILATION, AVOID SKIN CONTACT AND INHALATION OF THE VAPOUR.
Engines without S.B.71-5282 cold liquid degrease latch block (1) and hinges (2) and (3).
Engines with S.B.71-5282 cold liquid degrease latch block (1) and hinge (2).
- (5) Engines without S.B.71-5282 enter hinge (2) into hinge (3) and check door swivels freely, then holding both latches against spring pressure, press door into position and release latches, ensure correct location of latches in latch block.
Engines with S.B.71-5282 check hinge (2) for damage and security of attachment. Check door hinge is free then holding both latches against spring pressure, press door into position and release latches, ensure correct location of latches in latch block.
- (6) Check blow-out door is fitted flush with oil filler access panel.
- (7) Test blow out door latch loading (Ref. 71-11-01 Adjustment/Test). If blow-out door test satisfactory, refit/close blow-out door as detailed in operations (6) and (7). If blow-out door test unsatisfactory, adjust blow-out door latch loading and refit/close blow-out door.
- (8) Close left hand hinged cowl 413A or 423A (Ref. 71-11-00).

R
R
050B

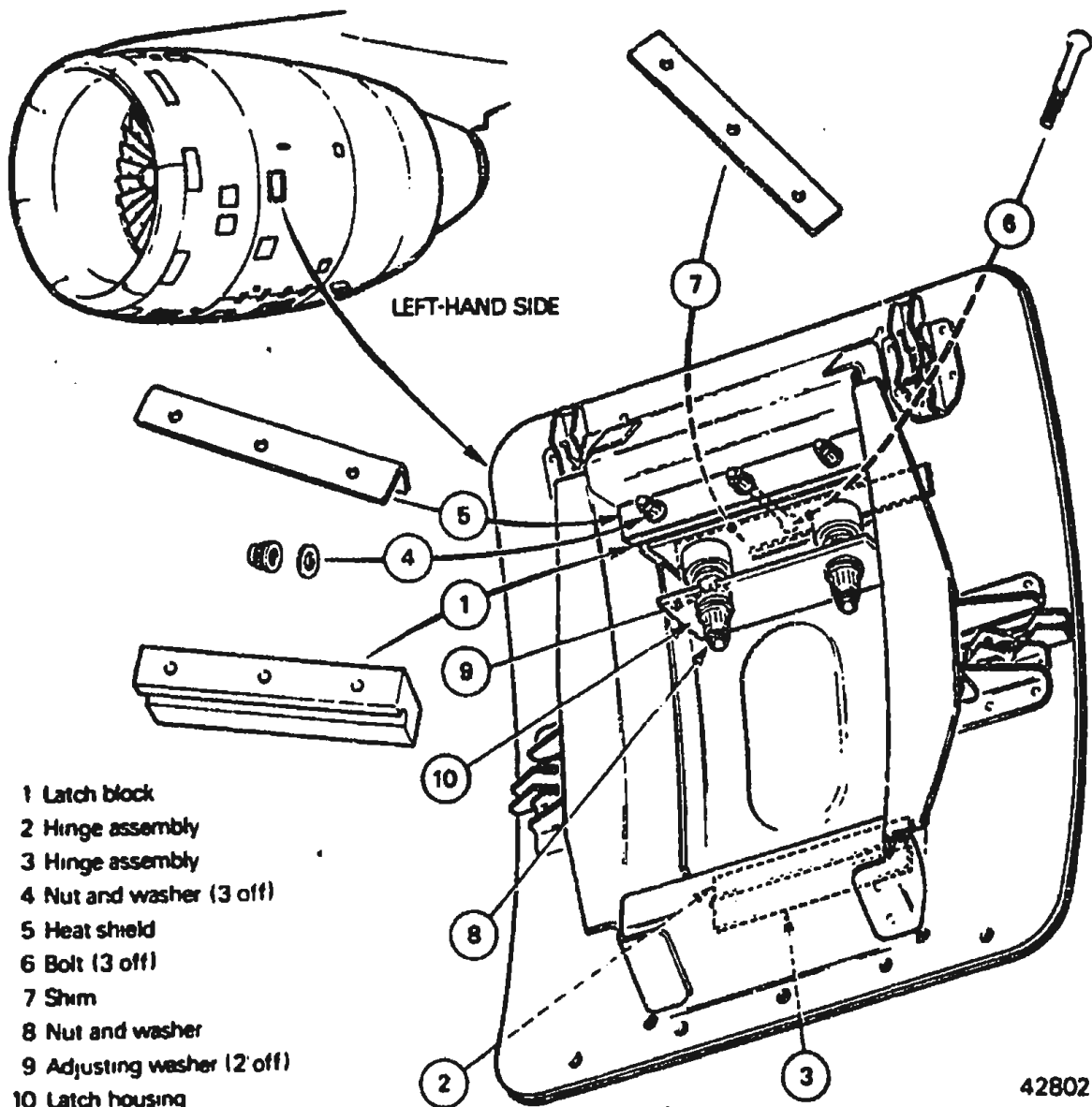
EFFECTIVITY: ALL

71-11-01
Page 405
Dec 15/92



RB.211 Propulsion System

MAINTENANCE



R
R
R

Oil filler access panel blow-out door without S.B.71-5282
Removal/Installation
Fig.402 (Sheet 1)

R
R

EFFECTIVITY: ALL

0508

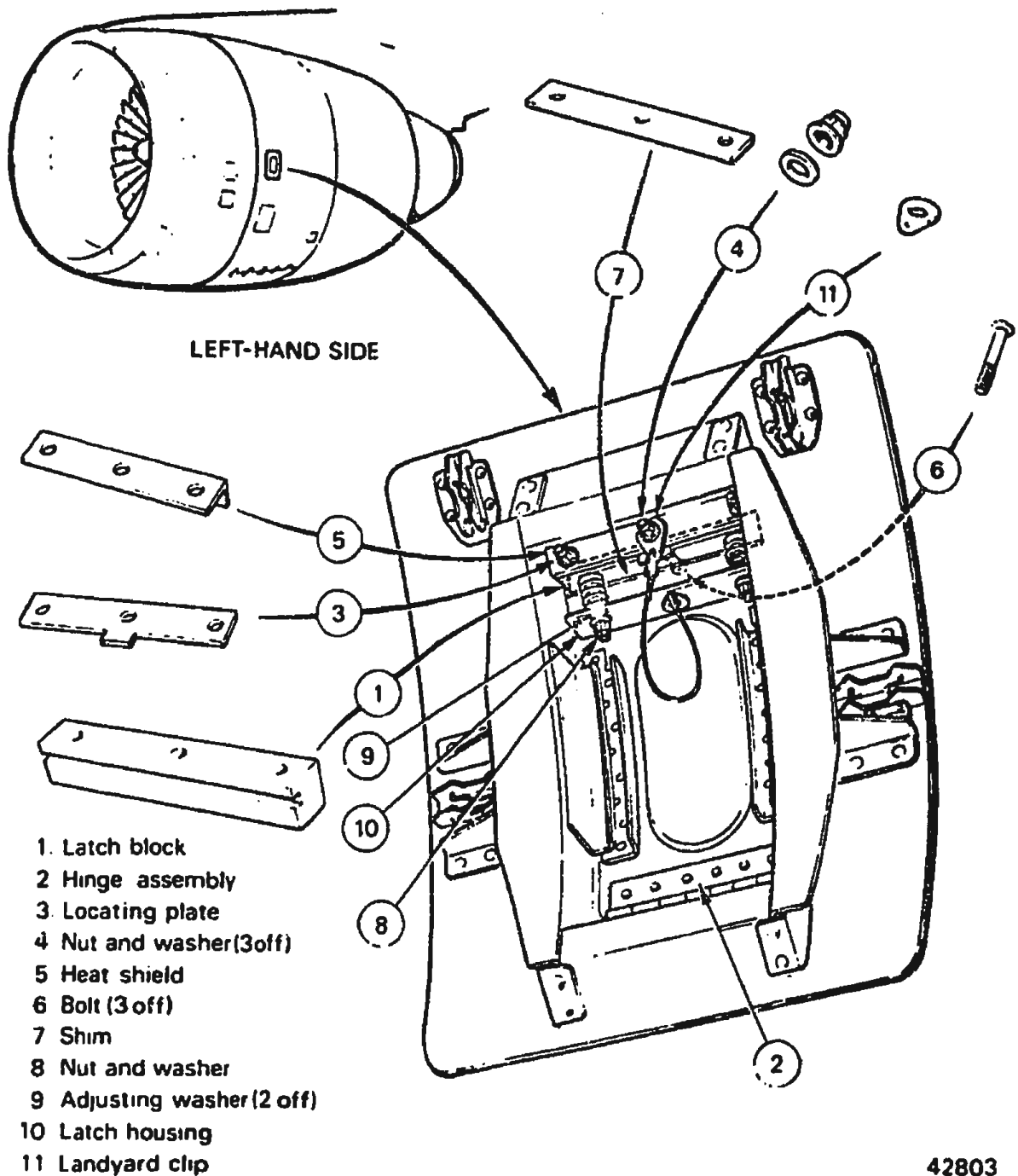
1A

71-11-01
Page 406
Dec 15/79



RB.211 Propulsion System

MAINTENANCE



42803

R
R
R

Oil filler access panel blow-out door with S.B.71-5282
Removal/Installation
Fig.402 (Sheet 2)

R
R

EFFECTIVITY: ALL

050B

1A

71-11-01
Page 407
Dec 15/79



RB.211 Propulsion System

MAINTENANCE

3. Removal/Installation Oil Filler Access Panel Blow-out Door Latch Block

Service Bulletin referred to:

71-5282 Oil filler access blow out door - additional stiffening features and increased pull off loading

A. Remove Blow-out Door Latch Block

- (1) Engines without S.B.71-5282 refer to fig.204 (sheet 1) remove nuts and washers (4), heatshield (5) and latchblock (1).

Engines with S.B.71-5282 refer to fig.204 (sheet 2) remove nuts and washers (4) heatshield (5) locating plate (3) and latchblock (1).

- (2) Remove bolts(6) and shim (7).

B. Install Blow-out Door Latch Block

- (1) Refer to fig.204, fit bolts (6) and shim (7).

- (2) Engines without S.B.71-5282 install latch block (1) then fit heatshield (5).

Engines with S.B.71-5282 install latch block (1) then fit locating plate (3) and heatshield (5).

- (3) Fit and secure nuts and washers (4) then torque tighten to 15 lb.in. (1,6 Nm.).

R EFFECTIVITY: ALL

050B

1A

71-11-01
Page 408
Dec 15/92



RB.211 Propulsion System

MAINTENANCE

LEFT HAND HINGED COWL - ADJUSTMENT/TEST

Service Bulletin referred to:

71-5282 Oil filler access blow-out door - additional stiffening features and increased pull off loading.

1. Adjust Blow-out Door Latch Load

The adjustment of both blow-out door latches is identical.

- A. **CAUTION:** ENSURE A MINIMUM PROTRUSION OF TWO THREADS IS VISIBLE AFTER THE INSTALLATION OF ADJUSTING WASHERS (9) AND NUT AND WASHERS (8)

Refer to fig.501 (Sheet 1 or 2) remove nut and washer (8) and by either removing or installing washers (9), adjust spring tension until the required operating load is achieved as detailed in para.2.B. and the gap between nut and washer (8) and latch housing (10) is 0.020in. (0.5 mm.) with the door in the installed position.

2. Test Blow-out Door Latch Load

- A. Equipment required:

HU21580 Load gauge

- B. Refer to fig.502. Position load gauge inside blow-out door, 0.50in. (12.70 mm.) in from latch edge of door, equidistant between latches, apply load in direction of arrow X.

- C. Check that load to operate door is:

Engines without S.B.71-5282, 44 to 48 lbf. (195.7 to 213.5 N)

Engines with S.B.71-5282, 62 to 68 lbf. (275.8 to 302.5 N)

- D. If loads outside limits adjust lock latch as detailed in Para.1.

R
R
050B

EFFECTIVITY: ALL

1A

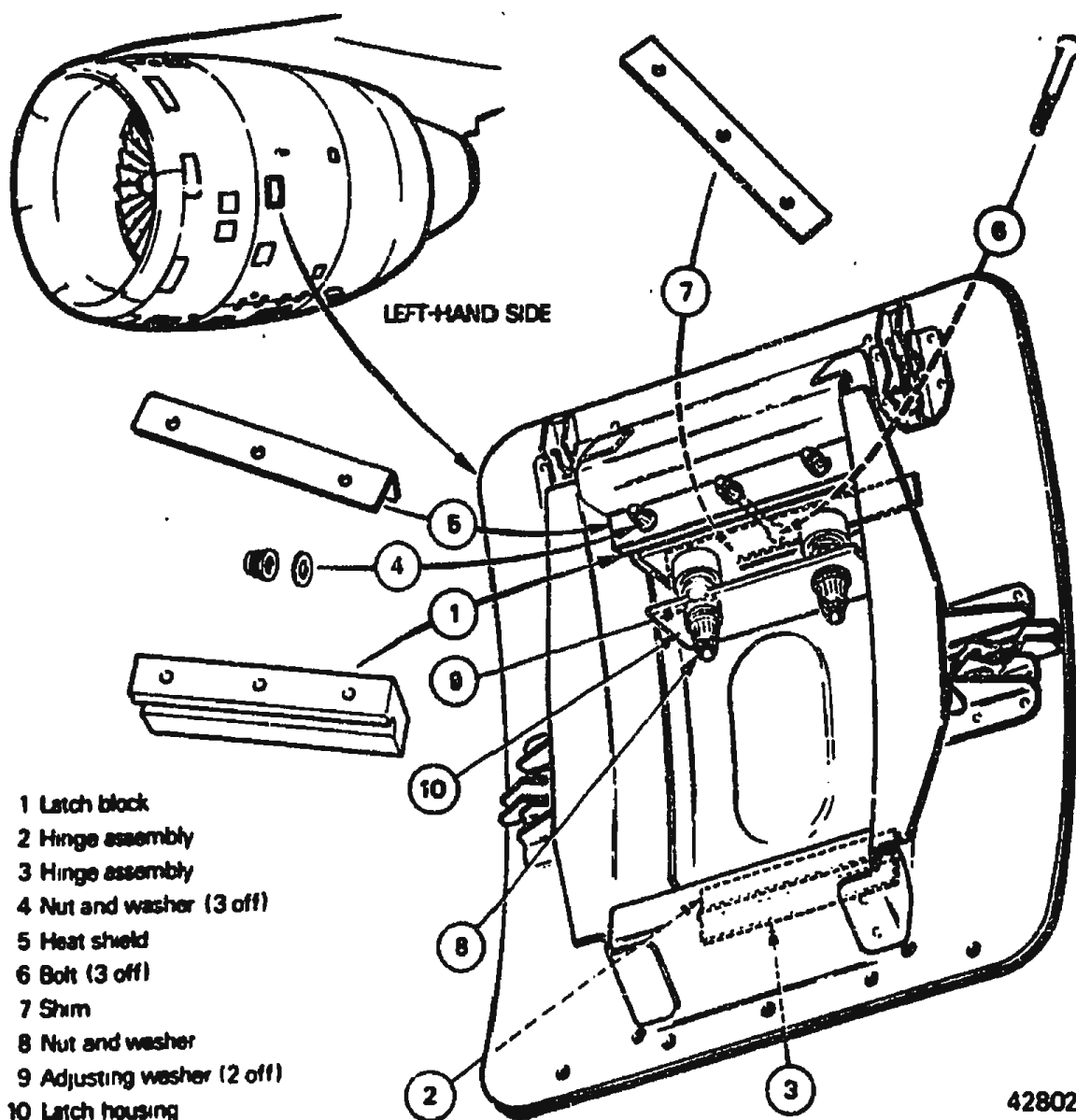
71-11-01

Page 501
Mar 15/91



RB.211 Propulsion System

MAINTENANCE



R
R
R

Oil filler access panel blow-out door (without S.B.71-5282)
Removal/Installation
Fig.501 (Sheet 1)

R
R

EFFECTIVITY: ALL

050B

71-11-01

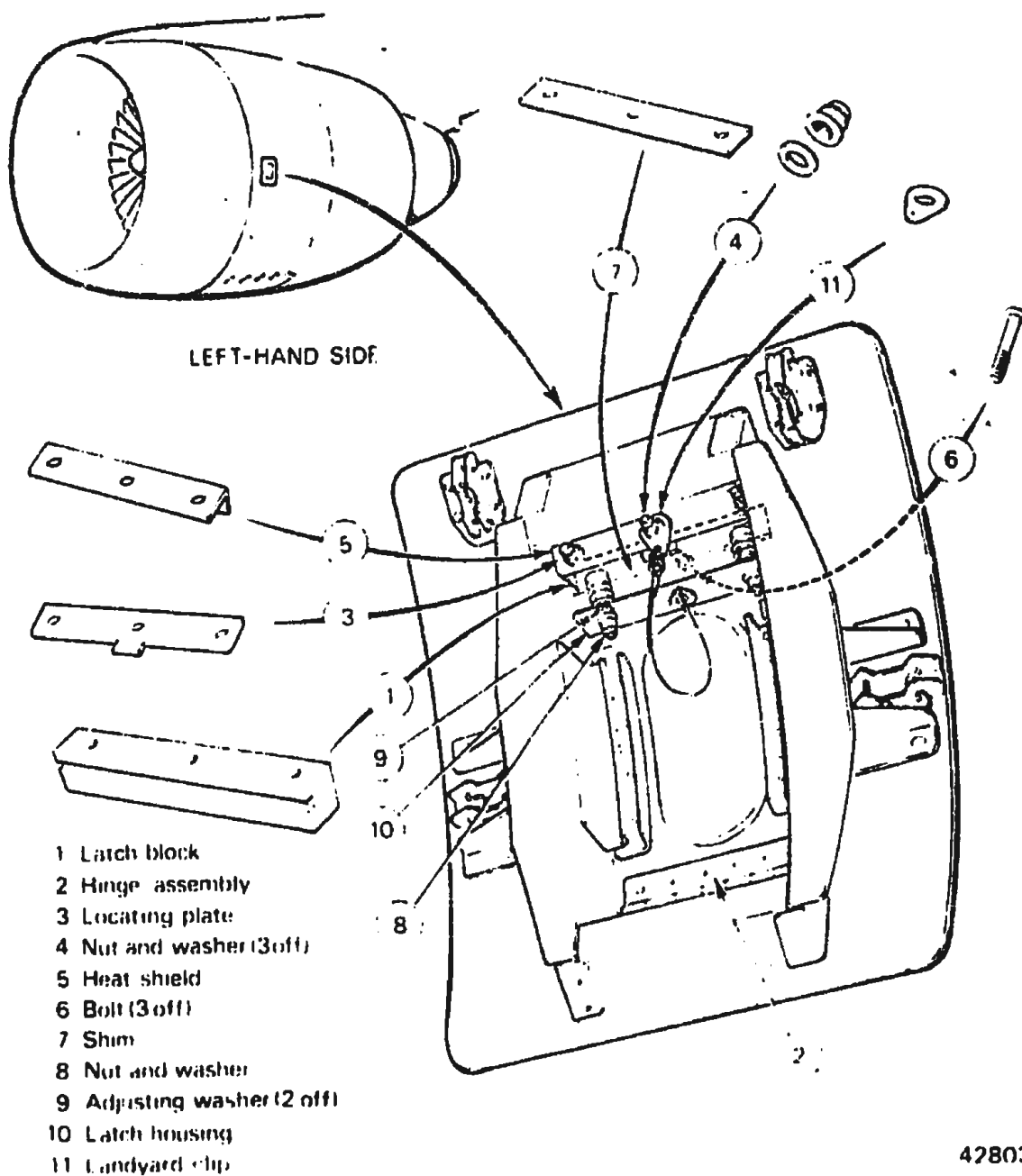
Page 502
Dec 15/79

1A



RB.211 Propulsion System

MAINTENANCE



42803

R
R
R

Oil filler access panel blow-out door (with S.B.71-5282)
Removal/Installation
Fig.501 (Sheet 2)

R
R

EFFECTIVITY: ALL

0508

1A

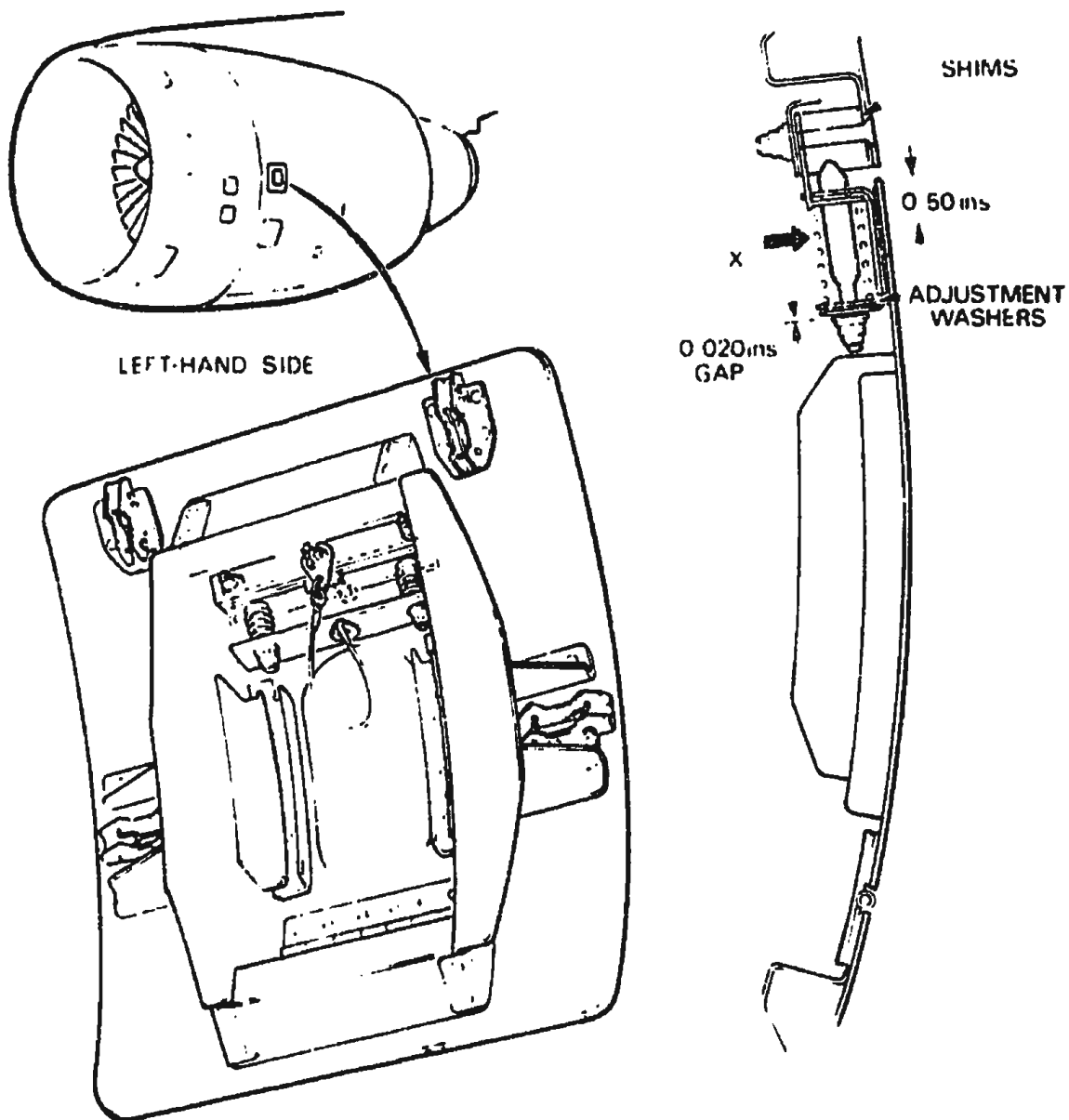
71-11-01

Page 503
Dec 15/79



RB.211 Propulsion System

MAINTENANCE



42804

Oil filler access panel blow-out door (with S.B.71-5282)
Adjustment/Test
Fig.502

EFFECTIVITY: ALL

71-11-01

Page 504
Dec 15/79

0508

1A



RB.211 Propulsion System

MAINTENANCE

R 3. Adjust Blow-Out and Fire Access Door Latch Load

R Service Bulletin referred to:

R 71-2261 Blow-out door locking pin - improved spring loading.

R The adjustment and test is identical on the right hand hinged
R cowl.

R The adjustment of both blow-out door latches is identical.

R A. CAUTION: ENSURE A MINIMUM PROTRUSION OF TWO THREADS IS
R VISIBLE AFTER THE INSTALLATION OF ADJUSTING
R WASHERS (3) AND NUT AND WASHERS (4).

R Refer to Fig.503 remove nut and washer (4) and by either
R removing or installing washers (3), adjust spring tension
R until the required operating load is achieved as detailed
R in para.4. The gap between the nut and washer (4) and
R latch housing (5) is 0.020in. (0.50 mm.) with the door in
R the installed position.

R 4. Test Blow-Out and Fire Access Door Latch Load

R A. Equipment required:

R HU21580 Load gauge
R HU21636 Load spreader

R B. Refer to Fig.503. Engines without S.B.71-2261, position load
R gauge fitted with load spreader inside blow-out door at latch
R edge of door equidistant between latches.

R Engines with S.B.71-2261, position load gauge fitted with load
R spreader inside blow-out door at 0.50in. (12,70 mm.) from
R latch edge, equidistant between latches.

R C. Apply load in direction of arrow X.

R D. Engines without S.B.71-2261 check that load to operate door
R outwards is 33.50 to 40 lbf (149 to 177.90 N).

R EFFECTIVITY: ALL

R
050B

71-11-01
Page 505
Mar 15/91

1A



RB.211 Propulsion System

MAINTENANCE

- R Engines with S.B.71-2261 check that load to operate door
R outwards is 48 to 50 lbf (213.50 to 222.40 N).
- R E. Close blow-out door to engage latches and position load
R gauge and load spreader outside blow-out door at position
R indicated in para.4.B., apply load in direction of arrow Y.
- R F. Engines without S.B.71-2261 check that load to operate door
R inwards is 27-32 lbf (120.10 to 142.30 N).
- R Engines with S.B.71-2261 check that load to operate door
R inwards is 40 to 42 lbf (177.90 to 186.70 N).
- R G. If loads outside limits adjust lock latch as detailed in
R para.3.

R EFFECTIVITY: ALL

R
050B

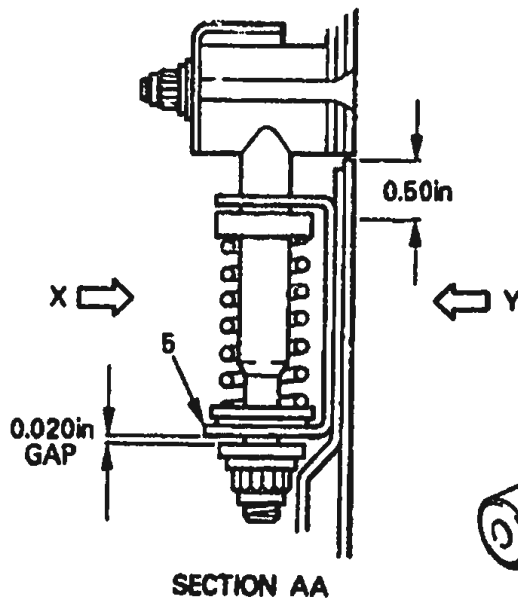
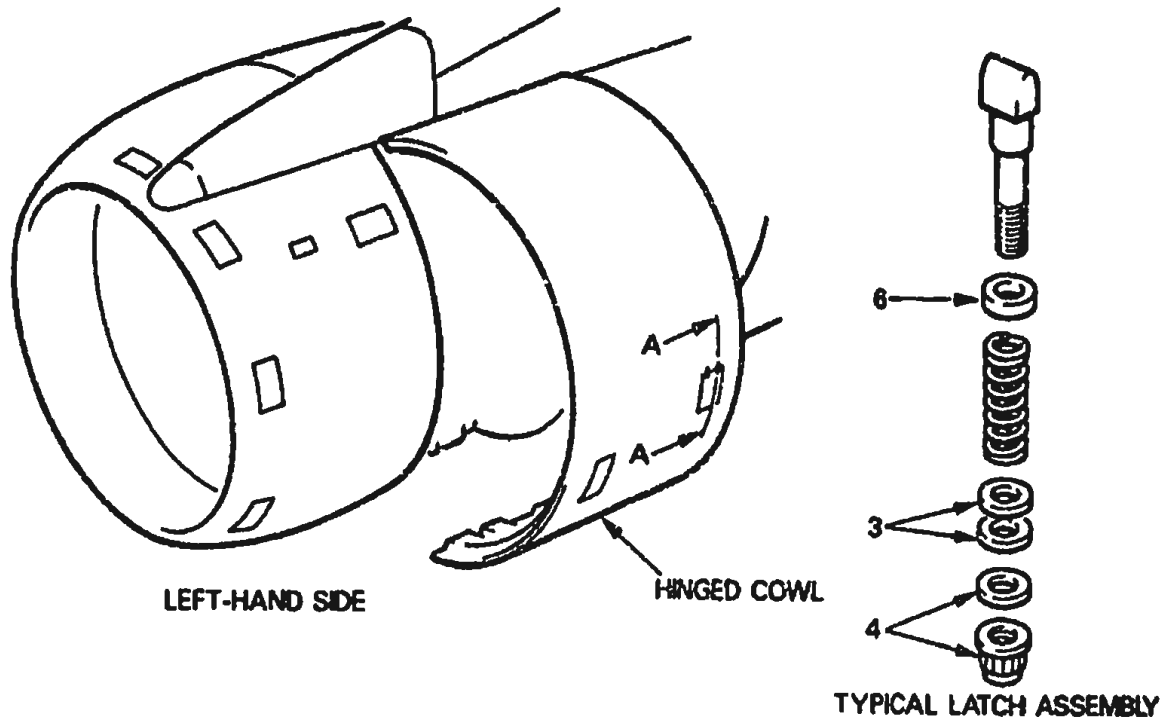
1A

71-11-01
Page 506
Mar 15/91

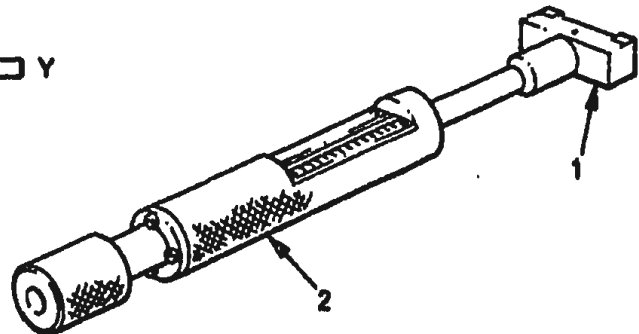


RB.211 Propulsion System

MAINTENANCE



- 1 Load spreader HU 21636
- 2 Load gauge HU 21580
- 3 Adjusting washers
- 4 Nut and washer
- 5 Latch housing
- 6 Special washer



A0336

Blow-out and fire access door Adjustment/Test Fig.503

R
R
R

R EFFECTIVITY: ALL

050B

1A

71-11-01
Page 507/508
Mar 15/91



RB.211 Propulsion System

MAINTENANCE

L.H. HINGED COWL - INSPECTION/CHECK

Referenced Procedures:

- 71-11-00 Cowling, Engines No.1 and No.3 - Servicing
- 71-11-00 Cowling, Engines No.1 and No.3 - Adjustment/Test

1. Inspection/Check

- A. Open hinged cowl 413A or 423A (Ref. 71-11-00, Servicing).
- B. Inspect hinged cowl exterior and interior for damage, corrosion, binding and security.
- C. Check latches for correct operation, and inspect for damage and excessive wear.
- D. Inspect seals for security, damage and deterioration.
- E. Inspect hinges for damage, binding and security.
- R F. Check cowl support struts and stowage bracket for correct operation, and inspect for damage and excessive wear.
- G. Close hinged cowl 413A or 423A (Ref. 71-11-00, Servicing).
- H. With engine cold, check clearance between bottom edges of L.H. and R.H. hinged cowls (Ref. 71-11-00, Adjustment/Test, fig.501 section AA) and adjust as necessary.

EFFECTIVITY: ALL

050B

1Q

71-11-01
Page 601/602
Dec 15/80

R-R Data
Page 401
May 15/77



RB.211 Propulsion System

MAINTENANCE

RIGHT-HAND HINGED COWL - REMOVAL/INSTALLATION

The procedure for removal and installation of the right-hand hinged cowl (Zone 414 and 424) is similar to that used for the left-hand hinged cowl (Ref. 71-11-01 Removal/Installation).

EFFECTIVITY: ALL

050B

1G

71-11-02
Page 401/402
May 15/77



RB.211 Propulsion System

MAINTENANCE

R

RIGHT-HAND HINGED COWL - ADJUSTMENT/TEST

R The procedure for adjustment and test of the right-hand hinged cowl
R blow out and fire access door is identical to that used for the left
R hand hinged cowl, (Ref.71-11-01).

R EFFECTIVITY: ALL

050B

1T

71-11-02
Page 501/502
Mar 15/91



RB.211 Propulsion System

MAINTENANCE

R.H. HINGED COWL - INSPECTION/CHECK

Referenced Procedures:

71-11-00 Cowling, Engines No.1 and No.3 - Servicing
71-11-00 Cowling, Engines No.1 and No.3 - Adjustment/Test

1. Inspection/Check

- A. Open hinged cowl 414A or 424A (Ref. 71-11-00, Servicing).
- B. Inspect hinged cowl exterior and interior for damage, corrosion, binding and security.
- C. Check latches for correct operation, and inspect for damage and excessive wear.
- D. Inspect seals for security, damage and deterioration.
- E. Inspect hinges for damage, binding and security.
- R F. Check cowl support struts and stowage bracket for correct operation, and inspect for damage and excessive wear.
- G. Close hinged cowl 414A or 424A (Ref. 71-11-00, Servicing).
- H. With engine cold, check clearance between bottom edges of L.H. and R.H. hinged cowls (Ref. 71-11-00, Adjustment/Test, fig.501 section AA) and adjust as necessary.

EFFECTIVITY: ALL

050B

1A

71-11-02
Page 601/602
Dec 15/80



RB.211 Propulsion System

MAINTENANCE

NOSE COWL - REMOVAL/INSTALLATION

Service Bulletins referred to:

- S.B.30-2171 Nose cowl - Deletion of shroud and introduction of ground test connection.
- S.B.71-2280 Nose cowl - Sliding lugs - Addition of identification markings.
- S.B.71-3097 Interphone receptacle repositioned.
- S.B.71-4162 Introduction of Orientated Essential Services Receptacle

Referenced Procedure

- 6-40-00 Exterior Access Doors and Panels - Description and Operation
- 70-12-02 Fitting Vee Band Coupling Clamps
- 70-51-00 Torque Tightening Technique
- 71-11-01 Left Hand Hinged Cowl - Removal/Installation
- 71-11-02 Right Hand Hinged Cowl - Removal/Installation

Illustrated Parts Catalogue References

The I.P.C. sections where parts disturbed during the following operations can be located are as follows:

- 30-21-20 Air Intakes Air Ducting (Engine No.1 and 3)
- 30-21-21 Nose Cowl Mounted Air Ducting (Engines No.1 and 3)
- 71-11-03 Nose Cowl
- 71-50-01 Light Duty Engine Electrical Harness
- 71-50-02 Nose Cowl Mounted Light Duty Electrical Harness

1. Removal/Installation Nose Cowl

CAUTION : THE NOSE COWL ASSEMBLY WEIGHS APPROXIMATELY 540 LB. (245 KG.).

NOTE : When removing or installing the nose cowl, only one leg of the sling is utilized. The sling is attached to the outboard attachment eye of the nose cowl to give the required angle relative to the power plant installation. On units incorporating S.B.71-2280, the attachment eyes are marked relative to power plant position.

R EFFECTIVITY: ALL

050B

1A

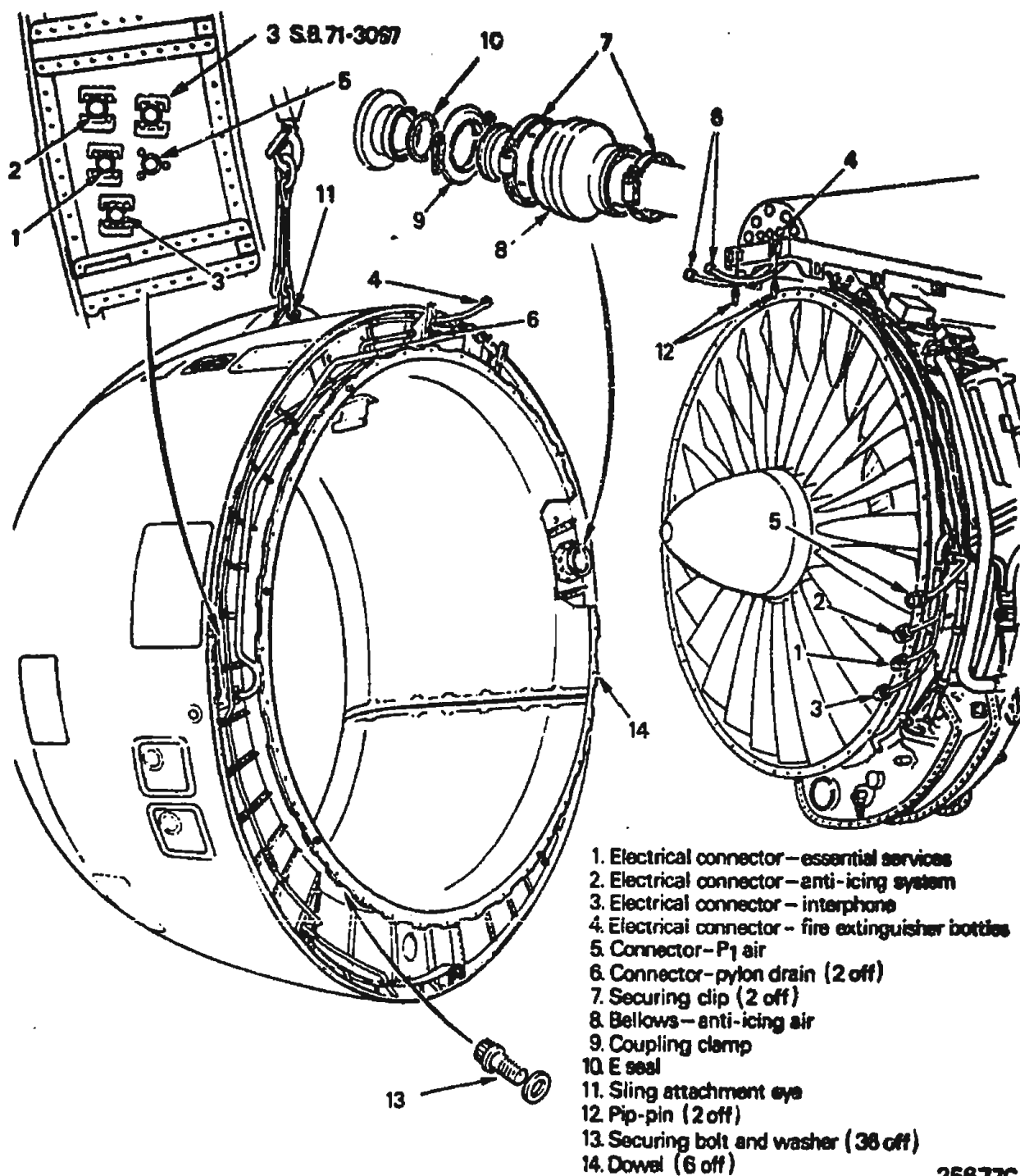
71-11-03

Page 401
Nov 15/86



RB.211 Propulsion System

MAINTENANCE



25877C

R
R

Nose cowl removal/installation
Fig.401

EFFECTIVITY: ALL

050B

1A

71-11-03

Page 402
Nov 15/82

 RB.211 Propulsion System
MAINTENANCE

A. Remove Nose Cowl

(1) Equipment required:

AVT2819 Extractor tool
CP.20091 Sling
CP.21280/2 Parking stand
or
CP.30343/4 Parking stand
CP.30450/1 Mounting ring
or) nose cowl -
CP.30508) parking stand

- (2)** Remove left-hand hinged cowl 413 or 423 (Ref. 71-11-01, Removal/Installation) and right-hand hinged cowl 414 and 424 (Ref. 71-11-02).
- (3)** Remove forward nose fairing 451AT or 461AT (Ref. 6-40-00).
- (4)** Open and tag appropriate ACCESS VENT AIR, and FIRE EXTINGUISHER MAIN and ALTN circuit breakers on pilots overhead circuit breaker panel CB1, zone 210.
- (5)** Open and tag GND SVCE INTPH circuit breaker on flight engineer/second officer's overhead circuit breaker panel CB2, zone 215.
- (6)** Refer to fig.401, disconnect electrical connectors (1) through (4).
- NOTE:** To avoid incorrect connection of connectors (1) and (3) during installation it is recommended that on engines not incorporating S.B.71-4162 electrical connector (1) plug and receptacle are tagged prior to disconnecting.
- (7)** Disconnect connectors (5) and (6).
- (8)** Release securing clips (7), slide bellows (8) rearwards and remove clamp (9) (Ref. 70-12-02). On engines incorporating S.B.30-2171, remove clamp (9) (Ref. 70-12-02).
- (9)** Using extractor tool remove E seal (10) (Ref. 70-12-02) from anti-icing tube flange and retain for refitment.

EFFECTIVITY: ALL

0508

1A

71-11-03
Page 403
Nov 15/86



RB.211 Propulsion System

MAINTENANCE

- (10) Attach sling CP.20091 to attachment eye (11) relative to power plant position and, using a hoist, take weight of nose cowl.
- (11) Remove pip pins (12).
- (12) Remove bolts and washers (13) then ease nose cowl forward to clear dowels (14) and L.P. compressor rotor spinner.
- (13) Lower nose cowl and position on parking stand CP.21280/2 or CP.30343/4
- (14) Remove sling CP.20091 and fit approved blanks to all apertures and connectors.

B. Install Nose Cowl

- (1) Equipment required:

CP.20091 Sling

- (2) Material required:

	British Spec./Ref.	American Spec./Ref.	OMat Item No.
Lockwire	DTD.189A 22 S.W.G.	- 21 A.W.G.	238

- (3) Ensure appropriate systems are tagged as detailed in operations A. (4) and (5).
- (4) Refer to fig.401, attach sling CP.20091 to attachment eye (11) relative to power plant position.
- (5) Remove blanks, if fitted, from all apertures and connectors.
- (6) Fit and check (Ref. 70-12-02) E-seal (10) in male flange of anti-icing tube.
- (7) Prepare clamp (9) and duct mating faces for fitment (Ref. 70-12-02).
- (8) Using a hoist, position nose cowl to L.P. compressor case front flange ensuring positive location of dowels (14).

R
R
050B

EFFECTIVITY: ALL

1A

71-11-03
Page 404
Nov 15/86

 RB.211 Propulsion System
MAINTENANCE

- (9) Fit and secure washers and bolts (13).
- (10) Fit pip pins (12).
- (11) Fit clamp (9) (Ref. 70-12-02).
- (12) On engines not incorporating S.B.30-2171, position bellows (8) and secure with clips (7).
- (13) Connect and secure connectors (6) then wirelock.
- (14) Connect and secure (Ref. 70-51-00, para.10) connector (5) then wirelock.
- (15) Check the integrity of the P1 system tubes, that they are correctly installed and wirelocked and unused unions correctly blanked and wirelocked.
- (16) Connect and secure electrical connectors (4) through (1) ensuring connectors (1) and (3) are not cross connected.
- (17) Remove sling.
- (18) Remove tags and close circuit breakers opened in operations A. (4) and (5).
- (19) Fit forward nose fairing 451AT or 461AT (Ref. 6-40-00).
- (20) Fit left-hand hinged cowl 413 or 423 (Ref. 71-11-01) and right-hand cowl 414 or 424 (Ref. 71-11-02).

R
R
R

EFFECTIVITY: ALL

0508

1A

71-11-03
Page 405/406
Nov 15/89



RB.211 Propulsion System

MAINTENANCE

NOSE COWL - ADJUSTMENT/TEST

1. Adjust Thermal Anti-icing (T.A.I.) Blow-out Door Latch Load

The procedure for adjusting both latches on the blow out door is identical

- A. Remove T.A.I. access panel assembly from the nose cowl.
- B. Refer to Fig.501. Adjust assembly to achieve correct dimension 'X'.
 - (1) Ensure blow-out door is closed and that the latch pins are engaged under the latch block.
 - (2) Adjust dimension 'X' to 3,81 mm. (0.15in.) by adding or removing laminated shims.
 - (3) Torque tighten latch block nuts to standard loading (Ref.70-51-00).
- R C. Adjust spring tension by adding or removing washers 1 or 2 to achieve the required blow-out load detailed in para.2.C.
- D. With the door in the closed position, adjust the latch pin nut to give the correct clearance 'Y' of 0,508 mm. (0.020in.).
- E. Refit access panel assembly to nose cowl.

2. Test Thermal Anti-icing (T.A.I.) Blow-out Door Latch Load

- A. Equipment required
 - Eye bolt - Thread type No.10-32 UNIF-3A
 - Load gauge - HU21580
 - (Spring balance, range to include 60-65 lbs.)
- B. Refer Fig.501. Remove centre screw from blow-out door and replace with eye bolt.
- C. Ensure blow-out door is fully closed and using load gauge attached to the eye bolt apply pull load to achieve door blow-out at a straight pull load of 60-64 lbs.

EFFECTIVITY: ALL

050B

1A

71-11-03
Page 501
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

- R D. If load is outside limits, adjust latch spring tension as
R detailed in para.1.D.
- R E. Remove eye bolt and refit centre screw, torque load to
R standard torque loading (Ref.70-51-00).

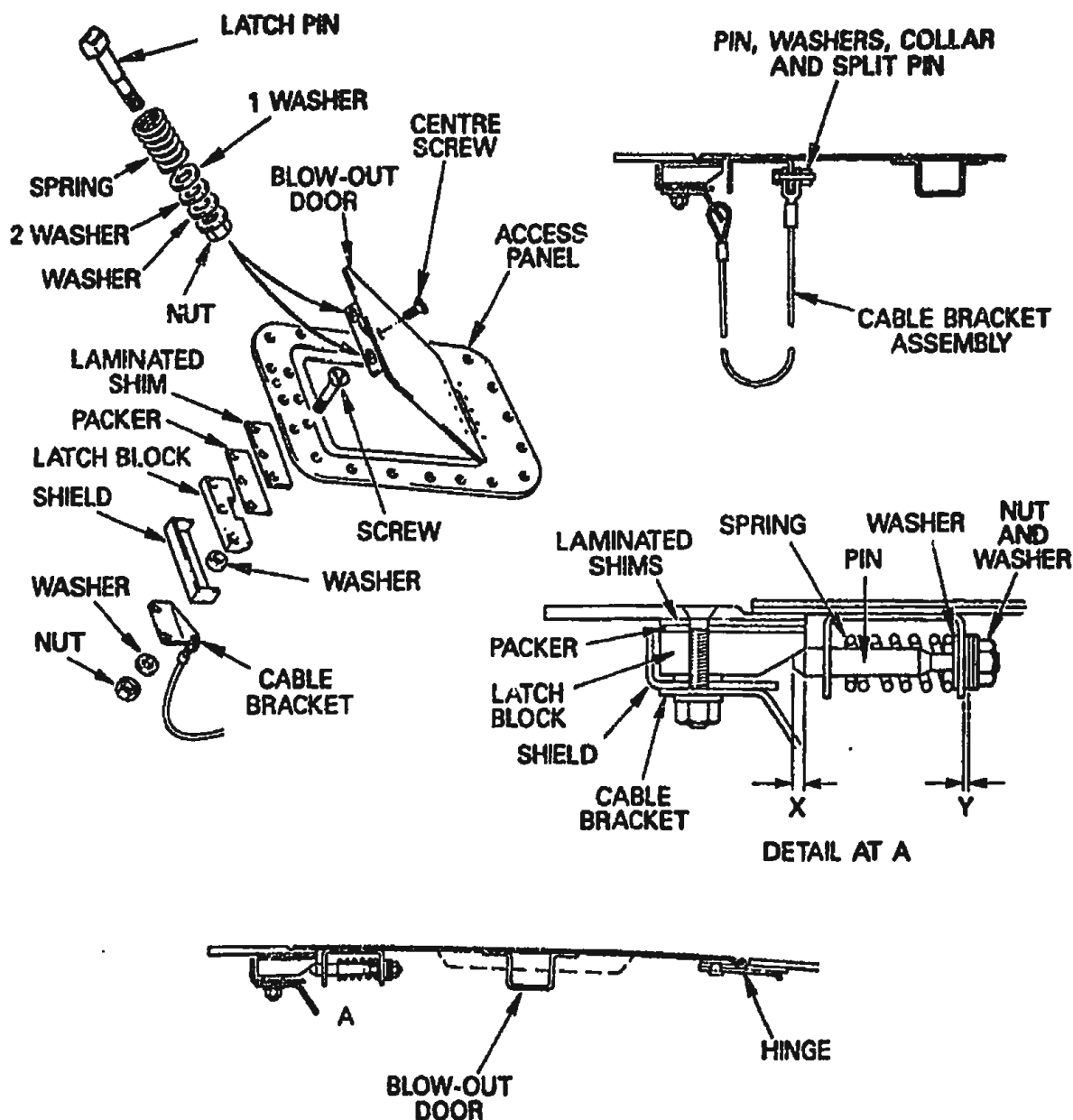
R EFFECTIVITY: ALL
R

050B

1A

71-11-03

Page 502
Jun 15/92



C2409

Thermal Anti-icing Access Panel and Blow-out Door
Fig. 501

EFFECTIVITY: ALL

0508

1A

71-11-03
Page 503/504
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

NOSE COWL - CLEANING, PAINTING AND PRESERVATION

1. Preservation of Nose Cowl

A. Fit Moisture Vapour Proof Bag to Transportation Stand.

(1) Equipment required:

CPS.2803
CP.22402/2
-

Moisture vapour proof (M.V.P.) bag
Transportation stand
General purpose sling

- (2) Refer to fig.701, fit general purpose sling to guard rail assembly.
- (3) Attach hoist to sling.
- (4) Release and remove bolts at positions A (Ref. fig.701) securing guard rail assembly to main frame assembly.
- (5) Lift guard rail assembly clear of stand and lower on to pallet.
- (6) Release and remove sling and hoist from guard rail assembly.
- (7) Release and remove bolts at positions B (Ref. fig.701) securing nose cowl mounting frame to rear of main frame assembly.
- (8) Remove mounting frame from main frame assembly.
- (9) Fit M.V.P. bag to main frame assembly.
- (10) Secure M.V.P. bag by fitting nose cowl mounting frame to main frame assembly then secure with bolts at positions B (Ref. fig.701).



RB.211 Propulsion System

MAINTENANCE

B. Transfer Nose Cowl from Parking Stand to Transportation Stand.

(1) Equipment required:

R
R

CP.20091	Sling
CP.21280/2	Parking stand
or	
CP.30343/4	Parking stand
CP.22402/2	Transportation stand
CP.21190	Sling, to lift transportation stand, with or without nose cowl
CP.30450/1)	Mounting ring
or)	Nose cowl
CP.30508)	Parking stand

R
R
R

- (2) Attach sling CP.20091 to attachment eyes on nose cowl.
- (3) Attach hoist to sling CP.20091.
- (4) Refer to fig.702, release and remove bolts securing nose cowl to mounting frame on parking stand.
- (5) Remove nose cowl from parking stand.
- (6) Position nose cowl on transportation stand, and ensure positive location of dowels in mounting frame.
- (7) Secure nose cowl to mounting frame.
- (8) Release and remove sling and hoist from nose cowl.

C. Storage of Nose Cowl in M.V.P. Bag

(1) Equipment required:

CP.11001	Instruction card
----------	------------------

(2) Material required:

	British Spec./Ref.	American Spec./Ref.	OMat Item No.
Desiccant and humidity indicator (Silica Gel)	BS.2540	-	1208

EFFECTIVITY: ALL

0508

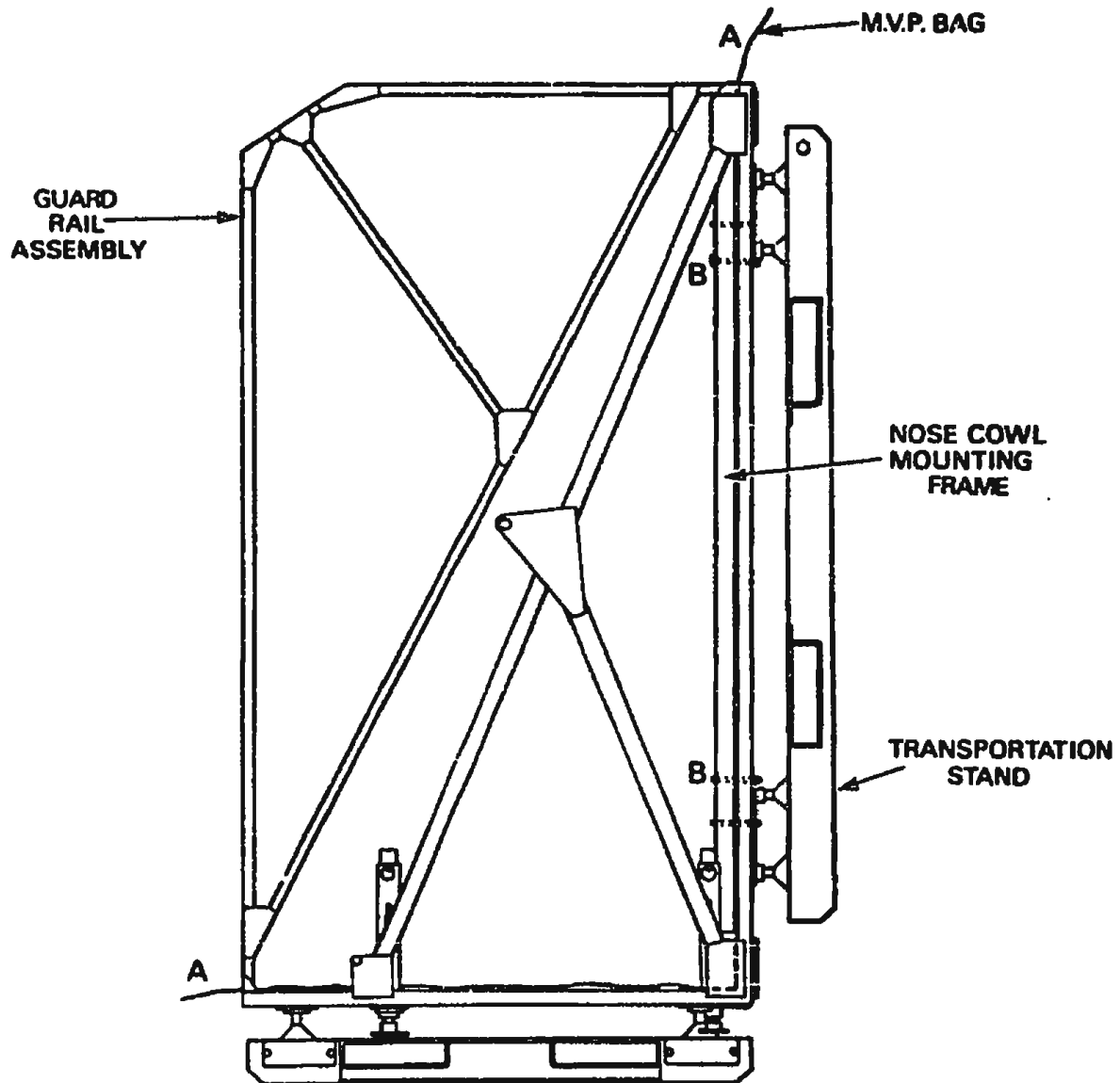
1Q

71-11-03
Page 702
Nov 15/86



RB.211 Propulsion System

MAINTENANCE



30927

Fit M.V.P. bag to transportation stand
Fig.701

EFFECTIVITY: ALL

0508

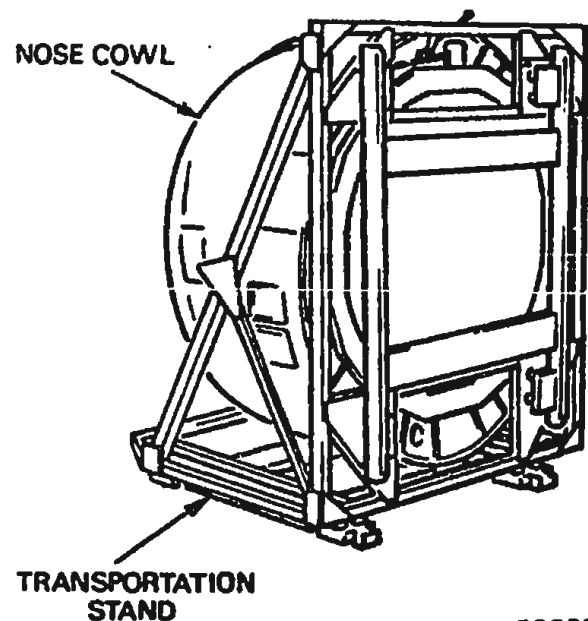
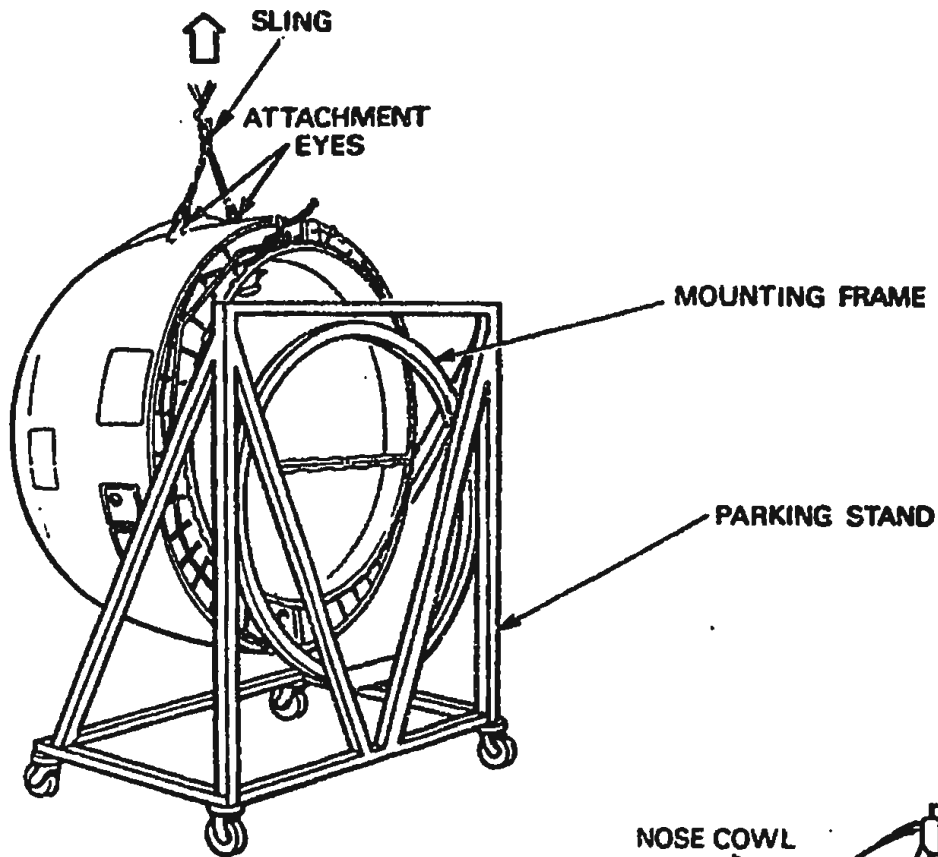
16

71-11-03
Page 703
May 15/77



RB.211 Propulsion System

MAINTENANCE



30928

Transfer nose cowl from parking stand to transportation stand
Fig.702

EFFECTIVITY: ALL

050B

16

71-11-03
Page 704
May 15/77



RB.211 Propulsion System

MAINTENANCE

- (3) **CAUTION:** EXPOSURE TO THE ATMOSPHERE WILL RAPIDLY IMPAIR THE PROPERTIES OF SILICA GEL DESICCANT AND IT IS IMPORTANT THAT THE DESICCANT IS PLACED IN POSITION AND THE M.V.P. BAG CLOSED WITHIN TEN MINUTES OF OPENING THE CONTAINERS.

Open a container of desiccant, remove humidity indicator and place in pocket provided on M.V.P. bag.

- (4) Place bags of desiccant in the M.V.P. bag, in accordance with amounts given in the table below for the period and conditions of storage.

<u>MONTHS</u>	<u>CONDITIONS</u>	
	<u>TEMPERATE</u>	<u>TROPICAL</u>
3	18 lb.	45 lb.
6	36 lb.	90 lb.
9	54 lb.	135 lb.
12	72 lb.	180 lb.

- (5) Close M.V.P. bag over nose cowl

NOTE: Instructions for closing M.V.P. bag are detailed on instruction card.

- (6) Complete table on instruction card in accordance with operation (4).
- (7) Place completed instruction card in pocket provided on M.V.P. bag.
- (8) Place nose cowl log book in a wrapping of P.V.C. film and place in pocket provided on M.V.P. bag then close pocket.

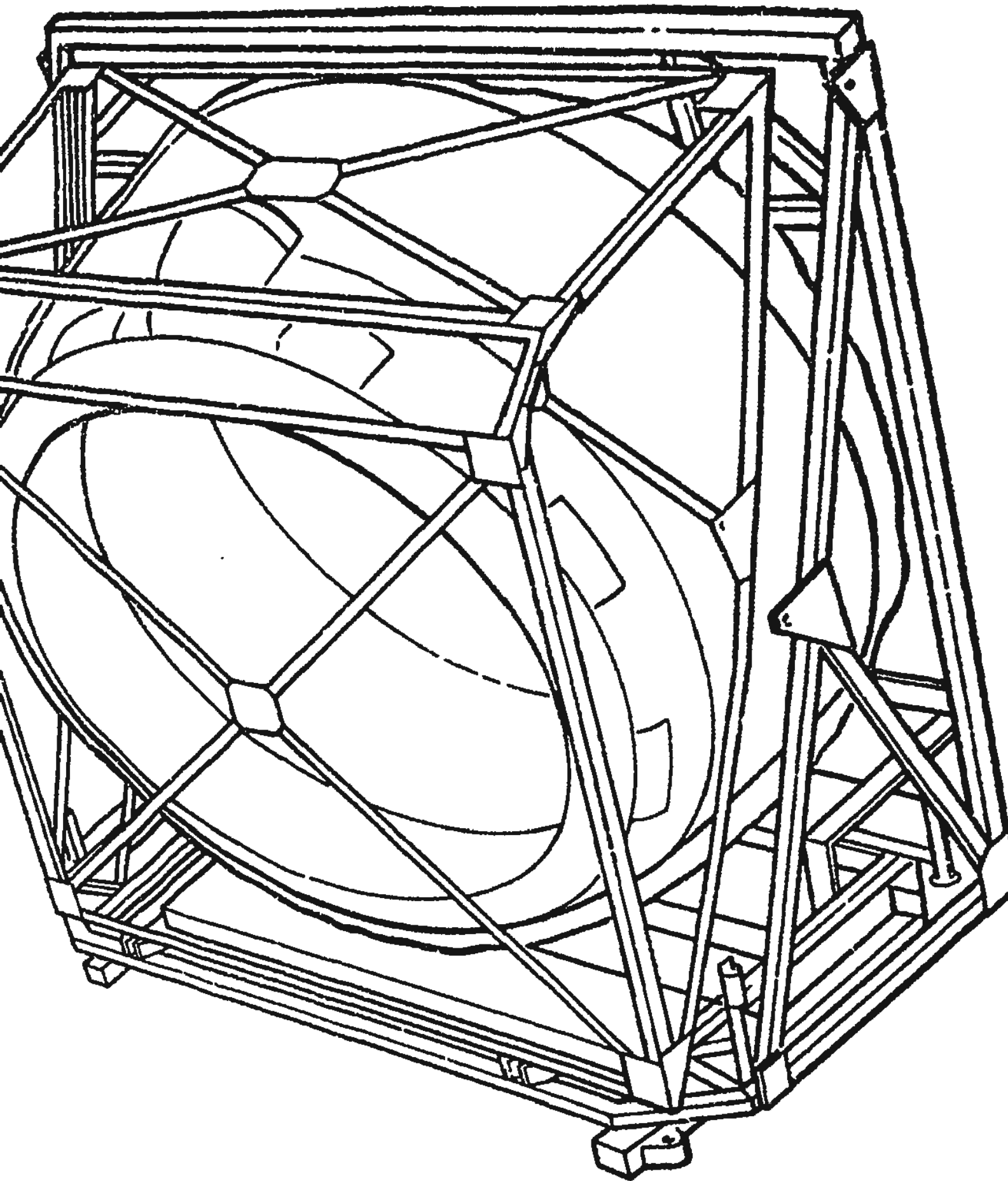
R EFFECTIVITY: ALL

050B

1Q

71-11-03

Page 705
Nov 15/86





RB.211 Propulsion System

MAINTENANCE

D. Fit Guard Rail Assembly to Main Frame Assembly

(1) Equipment required:

General purpose sling

(2) Refer to fig.701, fit general purpose sling to guard rail assembly.

(3) Attach hoist to sling.

(4) Lift guard rail assembly and offer up to main frame assembly.

(5) Fit guard rail assembly to main frame assembly and secure with bolts at positions A (Ref. fig.701).

(6) Release and remove sling and hoist from guard rail assembly. The nose cowl is now prepared for storage (Ref. fig.703).

EFFECTIVITY: ALL

050B

1Q

71-11-03
Page 707/708
Nov 15/86



RB.211 Propulsion System

MAINTENANCE

HINGED COWL SUPPORT STRUCTURE - INSPECTION/CHECK

Service Bulletin referred to:

S.B.71-2175 - Introduction of L.H. and R.H. Safety Retention Feature.

Reference Procedure:

71-11-00 Cowling, Engines No.1 and No.3 - Servicing

1. Inspection

A. Hinged Cowl Support Structure (Engine Installed).

- (1) Open hinged cowls 413A and 414A or 423A and 424A (Ref. 71-11-00).
- (2) Inspect visible areas of hinged cowl support structure for damage and security.
- (3) Inspect visible areas of seals for security, damage and deterioration, (cracking/peeling).
- (4) Inspect visible hinge positions for damage, binding and security.
- (5) Close hinged cowls 413A and 414A or 423A and 424A (Ref. 71-11-00).

CR

B. Hinged Cowl Support Structure (Engine Removed).

- (1) Inspect hinged cowl support structure for damage.
- (2) Inspect seals for security, damage and deterioration, (cracking/peeling).
- (3) Inspect hinge positions for damage, binding and security.
- (4) Inspect support cables for damage and security.
- (5) Engines with S.B.71-2175 incorporated - inspect hinged cowl retention lanyards.

CR
CR

EFFECTIVITY: ALL

0508

16

71-11-04
Page 601/602
Dec 15/91

LOCKHEED
MAINTENANCE MANUAL

ENGINE NO. 2 COWLING - DESCRIPTION AND OPERATION

1. General

Six removable cowl panels and an air intake adapter comprise the cowling for direct access to the fuselage-mounted QEC unit (Eng. No. 2). The cowl panels provide a smooth aerodynamic fairing between the afterbody aft/lower section, zone 318, and the thrust reverser translating cowl, zone 435. Quick-opening panels include left and right upper hinged cowls plus left and right lower hinged cowls. These cowls provide access to the engine accessory section and to the air intake (S-duct) adapter. Left and right mid fixed cowls provide structural support between the aircraft afterbody and the firewall and reverser diaphragm for hinged cowl attachment and latching. Fixed cowl panels are removable to accommodate replacement of the QEC unit.

Upper hinged cowls are pivoted from the center engine support structure, zone 471. The lower hinged cowls are pivoted from the mid fixed cowls. Access doors in the lower hinged cowls facilitate servicing power plant components (Ref. Fig. 1).

The air intake (S-duct) adapter serves as a flexible coupling between the Eng. No. 2 fan case and the aircraft S-duct. The air intake has an access door to gain entry into the S-duct and the low-pressure compressor (fan) area (Ref. Fig. 2).

2. LH and RH Lower Hinged Cowl

A. Description and Operation

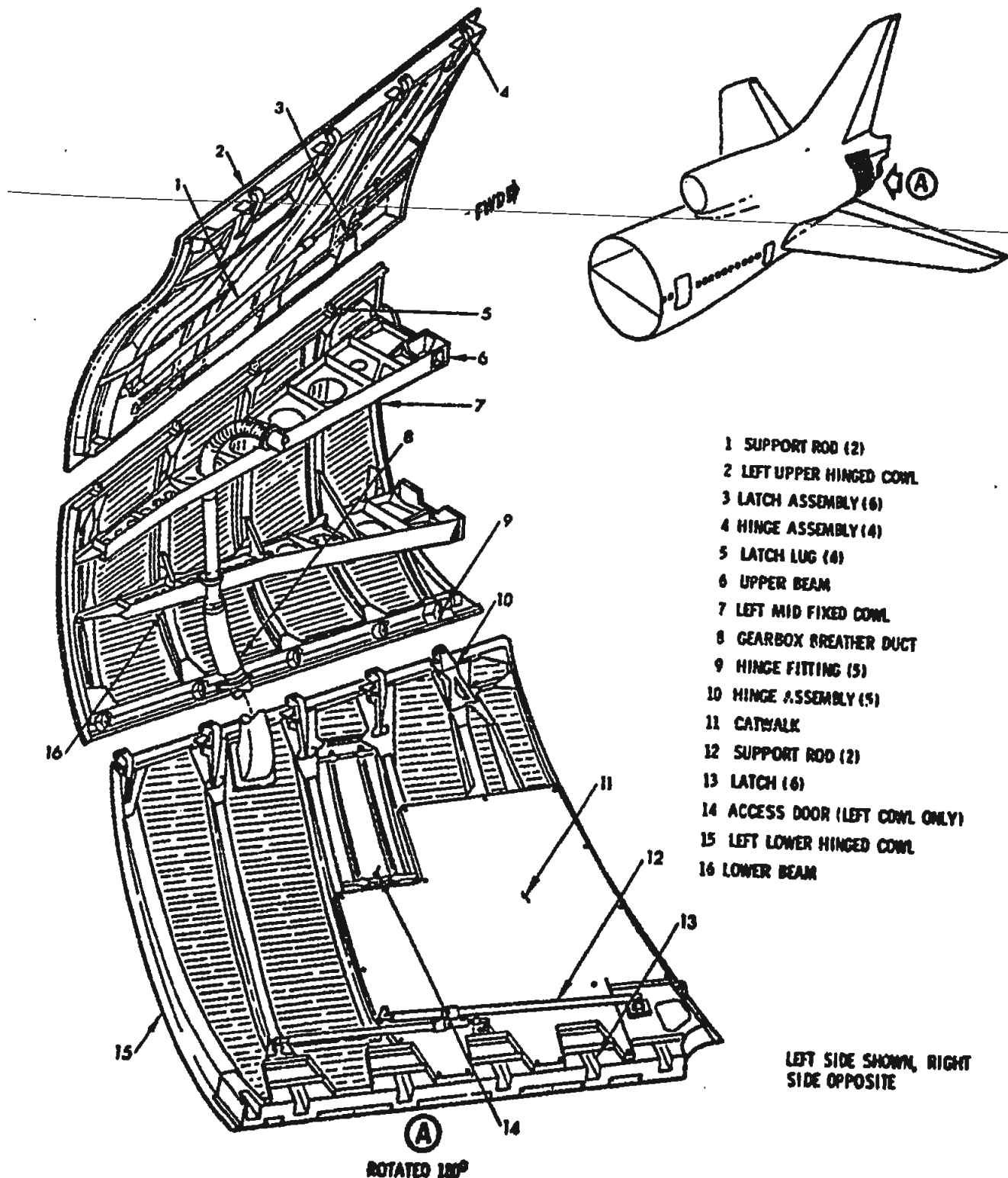
The LH and RH lower hinged cowls (panels) are installed to the rear of the afterbody aft/lower section, zone 318. Both panels are hinged from fixed cowl panels, which serve as fairings between the afterbody canted bulkhead and the translating cowl, zones 433 and 434. Each lower hinged cowl panel is supported on five hinge assemblies. When open or removed, the cowl panels provide access to the entire lower half of the engine accessory section and to the air intake (S-duct) adapter. The hold-open struts (support rods), mounted on swivel joints, support the cowl panels in the open position. Ball detent type locks permit extension of the strut rods to provide maximum cowl opening. The strut assemblies fold down on the inside of the panel for stowage. The left cowl panel has six flush-mounted, hook-type latches that engage six latch U-bolts on the right panel for secure fastening. A pin latch is used in the leading edge of each lower panel to lock the cowl panels securely to the canted bulkhead.

EFFECTIVITY: ALL

71-12-00

Page 1
May 15/77

LOCKHEED
MAINTENANCE MANUAL



- 1 SUPPORT ROD (2)
- 2 LEFT UPPER HINGED COWL
- 3 LATCH ASSEMBLY (6)
- 4 HINGE ASSEMBLY (4)
- 5 LATCH LUG (4)
- 6 UPPER BEAM
- 7 LEFT MID FIXED COWL
- 8 GEARBOX BREATHER DUCT
- 9 HINGE FITTING (5)
- 10 HINGE ASSEMBLY (5)
- 11 CATWALK
- 12 SUPPORT ROD (2)
- 13 LATCH (6)
- 14 ACCESS DOOR (LEFT COWL ONLY)
- 15 LEFT LOWER HINGED COWL
- 16 LOWER BEAM

LEFT SIDE SHOWN, RIGHT
SIDE OPPOSITE

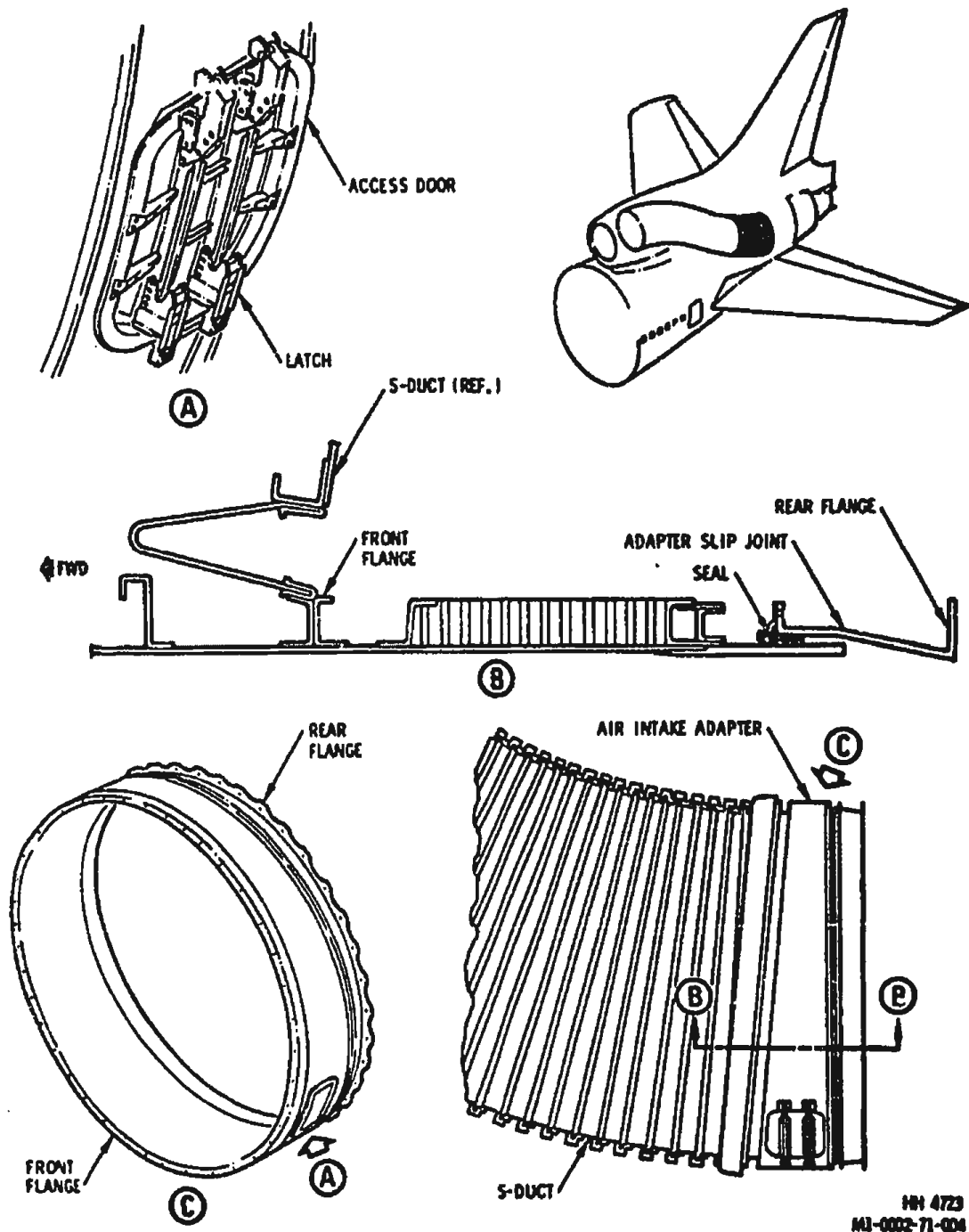
MI-0101-71-003

Engine No. 2 External Cowling
Figure 1

ITY: ALL

71-12-00
Page 2
May 15/77

LOCKHEED
MAINTENANCE MANUAL



HH 4723
M1-0002-71-004

Engine No. 2 Air Intake Adapter
Figure 2

R
R

EFFECTIVITY: ALL

001B

71-12-00
Page 3
Jun 15/80



Access doors are located in both lower cowl panels. Both doors are flush-mounted. Each door is secured with two flush-mounted, snap-action latches. The access door in the left cowl panel is large enough to permit passage of a man for component servicing. A blowout door is centered in the right access door.

A catwalk covers the inner structure of the left cowl panel in an area below and forward of the access door. The catwalk provides a work platform to perform maintenance on the power plant while the lower hinged cowl panels are closed.

An air ejector duct is mounted on the forward portion of the right cowl panel; the duct exhausts through a rectangular opening in the outer skin panel. The inner end of the ejector duct serves as a receptacle for the engine compartment accessory cooling air ejector nozzle assembly. Refer to 75-20-00 for detailed information on the accessory cooling components.

R
R
R
R
R
R

The left cowl panel has a louvered duct and mast for engine gearbox centrifugal breather overboard venting. A section of wire-wound hose connects the duct to a hose adapter. When the cowl panel is installed, a double T-bolt V-band coupling connects the gearbox breather rigid duct to the vent hose adapter.

3. LH and RH Mid Fixed Cowl

A. Description and Operation

The LH and RH mid fixed cowls (panels), which are located in line with the horizontal stabilizers, provide a fixed fairing on each side of the aircraft between the afterbody and thrust reverser translating cowl, zones 433 and 434 (Ref. Fig. 1). These panels are supported on upper and lower beams that are bolted to the canted bulkhead (firewall) FS 2011.09. The panels provide a smooth, faired surface between the afterbody and the engine translating cowl. The panels are removed to replace the complete QEC unit.

Internal-wrenching bolts secure each panel to the firewall. The bolts screw into captive barrel nuts in the afterbody. The panels are cantilever structures with upper and lower beams carrying the loads to airframe structure. Flush bolts attach the aft end of each panel to a firewall seal at PPS 124 (engine firewall and thrust reverser diaphragm). Four latch lugs spaced along the panel upper edge mate with latch assemblies on each upper hinged cowl panel. Five hinge

EFFECTIVITY: ALL

71-12-00

Page 4

May 15/77

LOCKHEED
MAINTENANCE MANUAL

fittings spaced along the lower edge provide support for each lower hinged cowl panel. Bolts with lubrication fittings are used in each hinge assembly.

4. LH and RH Upper Hinged Cowl

A. Description and Operation

The LH and RH upper hinged cowls (panels) are hinged from the afterbody center engine support structure, zone 471. Each panel is pivoted on four hinge assemblies fitted with bolts equipped with lube fittings. Six quick-release latch assemblies are used on each panel: four along the lower edge, and two on the front edge. The lower latch pins engage latch lugs on the mid fixed cowl panels. The front latches are of the sliding bolt-action type (Ref. Fig. 1), which mate with receptacles in the aft canted bulkhead of the afterbody. Hold-open struts (support rods) support both panels in the open position. Maintenance can be performed on the entire upper portion of the engine accessory section when panels are open or removed. The struts are variable in length, using twist-type friction locks for security. When not in use, the struts are retracted to minimum length and folded flat against the cowl panel.

5. Air Intake Adapter

A. Description and Operation

The air intake (S-duct) adapter is a flexible transition piece fitted between the engine and the S-duct (Ref. Fig. 2). Measuring 7.5 feet in diameter, the adapter bolts to the front flange of the low-pressure (LP) compressor case (fan case) and to the rear flange of the S-duct. The rear flange of the adapter is scalloped to match the case flange. Two major components comprise the S-duct adapter: the adapter slip-joint cone and the adapter segment assembly. The inner surface of both components is flush-riveted and presents a smooth airflow surface. A hinged access door with snap-action latches is located in the left side of the adapter segment. The sealed slip joint permits compression of the adapter for removal from the aircraft. If the QEC unit is to be removed from the aircraft without removing the adapter, the spinner can be detached and stowed in the S-duct. With the adapter rear flange detached from the engine, the adapter can be compressed for clearance.

EFFECTIVITY: ALL

0018

71-12-00
Page 5/6
May 15/77

LOCKHEED
MAINTENANCE MANUAL

ENGINE NO. 2 COWLING - ADJUSTMENT AND TEST

1. General

The following procedures provide alignment of hinge fittings for free installation of hinge pins.

2. Equipment and Materials

Shim, PN 1547378-103 (0.063 laminated steel), or equivalent
Shim, PN 1518811-101 (0.125 laminated aluminum), or equivalent
Shim, PN 1563089-101 (0.063 laminated steel), or equivalent
Shim, PN 1563089-105 (0.050 titanium), or equivalent
Shim, PN 1547378-101 (0.063 laminated steel), or equivalent
Washer, PN 967204 (0.063 steel), or equivalent
Shim, PN 1519085-103 (0.063 laminated aluminum), or equivalent
Shim, PN 1519752-103 (0.063 laminated aluminum), or equivalent
Fitting, PN 1546242-101, or equivalent

3. Referenced Procedures

71-12-01 LH and RH Lower Hinged Cowl - Removal and Installation
71-12-05 LH and RH Upper Hinged Cowl - Removal and Installation

4. Adjustment/Test

A. LH or RH Upper Hinged Cowl

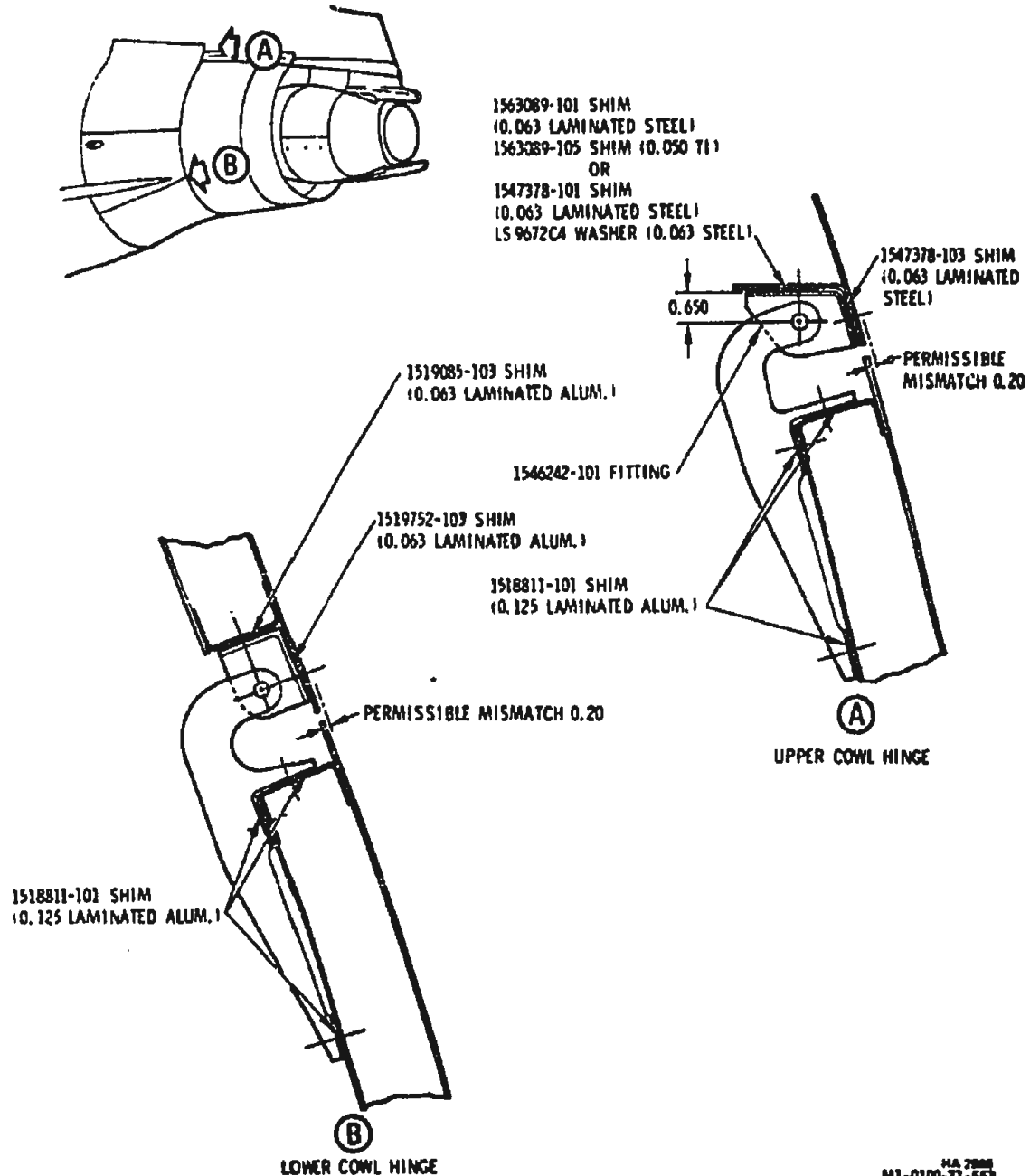
- (1) Install applicable upper hinged cowl 433DL or 434 DR and check for free installation of forward and aft hinge pins (Ref. 71-12-05).
- (2) Align forward and aft hinge fittings by adding or removing shims under fittings as necessary (Ref. Fig. 501).

EFFECTIVITY: ALL

001E

71-12-00
Page 501
May 15/77

LOCKHEED
MAINTENANCE MANUAL



MA 2000
M1-0100-71-553

R
R

Cowl Hinge Shimming
Figure 501

EFFECTIVITY: ALL

0016

71-12-00
Page 502
Aug 15/81



MAINTENANCE MANUAL

- (3) Remove cowl and establish straight hinge line on structure between forward and aft hinge points.
- (4) Shim remaining hinge fittings for alignment as necessary.

NOTE: Alignment of hinge pin may require installation of a new fitting to provide more shim allowance.

- (5) Install cowl with hinge pins at forward and aft hinge points only.
- (6) Close cowl and ensure that all latches engage properly.
- (7) Unlatch cowl and obtain free pin installation at remaining hinge points by shimming hinge on panel.
- (8) Close cowl and ensure that all latches engage properly.

B. LH or RH Lower Hinged Cowl

- (1) Install applicable lower hinged cowl 433AL or 434AR and check for free installation of forward and aft hinge pins (Ref. 71-12-01).
- (2) Align forward and aft hinge fittings by adding or removing shims under fittings as necessary (Ref. Fig. 501).
- (3) Remove cowl and establish straight hinge line on mid fixed cowl between forward and aft hinge points.
- (4) Shim remaining hinge fittings for alignment as necessary.
- (5) Install cowl with hinge pins at forward and aft hinge points only.
- (6) Close cowl and ensure that all latches engage properly.
- (7) Unlatch cowl and obtain free pin installation at remaining hinge points by shimming hinge on panel.
- (8) Close cowl and ensure that all latches engage properly.

Engine No. 2 Cowling- Inspection and Check.1. Referenced Procedures

71-12-00 Engine No. 2 Cowling - Adjustment and Test

2. Inspection/Check

A. Hinged Cowl (Upper and Lower)

- (1) Inspect cowl exterior and interior for damage, corrosion, binding, and security; hold open struts for correct operation, damage and excessive wear.
- (2) Inspect latches for proper operation; seals for security, damage, and deterioration; hinges for damage, binding and security.
- (3) Check cowling for permissible mismatch (71-12-00).

B. Mid Fixed Cowl

- (1) Inspect cowl exterior and interior for damage, corrosion, and security.
- (2) Inspect hinge fittings for damage, binding and security.

CR C. Engine Oil Access Door in Lower L/H Panel

CR (1) Inspect door latches for wear and for
CR swelling/deterioration of the rubber gasket.CR (2) Inspect door frame skin around opening in cowl panel
CR for wear at latch mating surfaces.

EFFECTIVITY: ALL

001B

71-12-00
Page 601/602
Nov 15/83

LOCKHEED
MAINTENANCE MANUAL

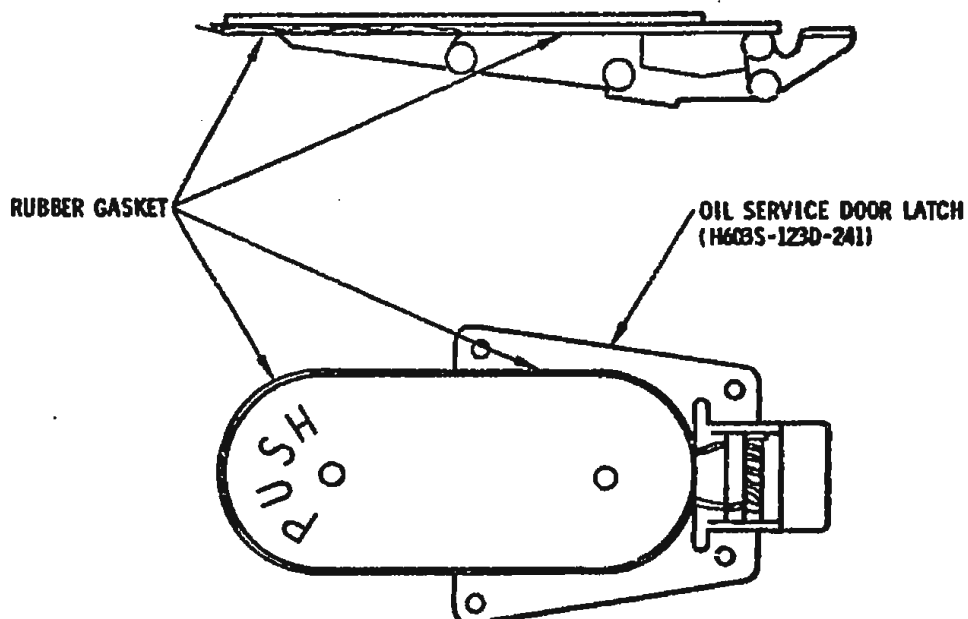
CR Engine No. 2 Cowling - Approved Repairs

CR 1. Oil Service Access Door Latch

CR A. Remove rubber gasket from latch cover plate.

CR NOTE: Rubber is susceptible to swelling and deterioration
CR from engine oil.

CR B. Replace the latch if hinge points and/or pins are worn.



M1-0000-71-092

Oil Service Door Latch Repair
Figure 801

CR
CR

R EFFECTIVITY: ALL
R
001B

71-12-00
Page 801/802
Nov 15/83

LOCKHEED
MAINTENANCE MANUAL

LH AND RH LOWER HINGED COWLS - SERVICING

1. General

The following procedure applies when opening or closing either the LH or RH lower hinged cowl.

2. Open/Close

WARNING: AVOID OPENING LOWER HINGED COWL PANELS WHEN STRONG WIND OR GUST CONDITIONS EXIST.

A. Open

R **CAUTION:** BECAUSE OF THE ALIGNMENT PINS LOCATED AT THE LOWER PARTING EDGE OF THE COWL PANELS, BOTH PANELS HAVE TO BE OPENED AT THE SAME TIME. ONCE THE DOORS HAVE PARTED FROM THE PINS, LOWERING THE LEFT HAND PANEL SHOULD COME FIRST. THE RH PANEL "U" BOLTS REST UNDERNEATH THE LH DOOR LATCH HOOKS.

- (1) Release the hook-type latch assemblies (Ref. Fig. 301) along the bottom edge of the panel.
- (2) Support the bottom of the cowl panels prior to releasing the forward pin latches (Ref. Fig. 301), Zone 433 or 434.
- (3) Let panels settle allowing the alignment pins to part, then allow the left hand panel to be lowered first, to the hanging position.
- (4) Hold the cowl panel open from the inside and perform the following:
 - (a) Release the cowl panel strut assemblies (Ref. Fig. 301) from their brackets.
 - (b) On the LH lower hinged cowl, loosen clamp, disconnect air duct hose from oil breather outlet and position to one side.

WARNING: THE COLLAR RELEASE AND BALL MUST BE SECURELY LOCKED TO PREVENT INJURY.

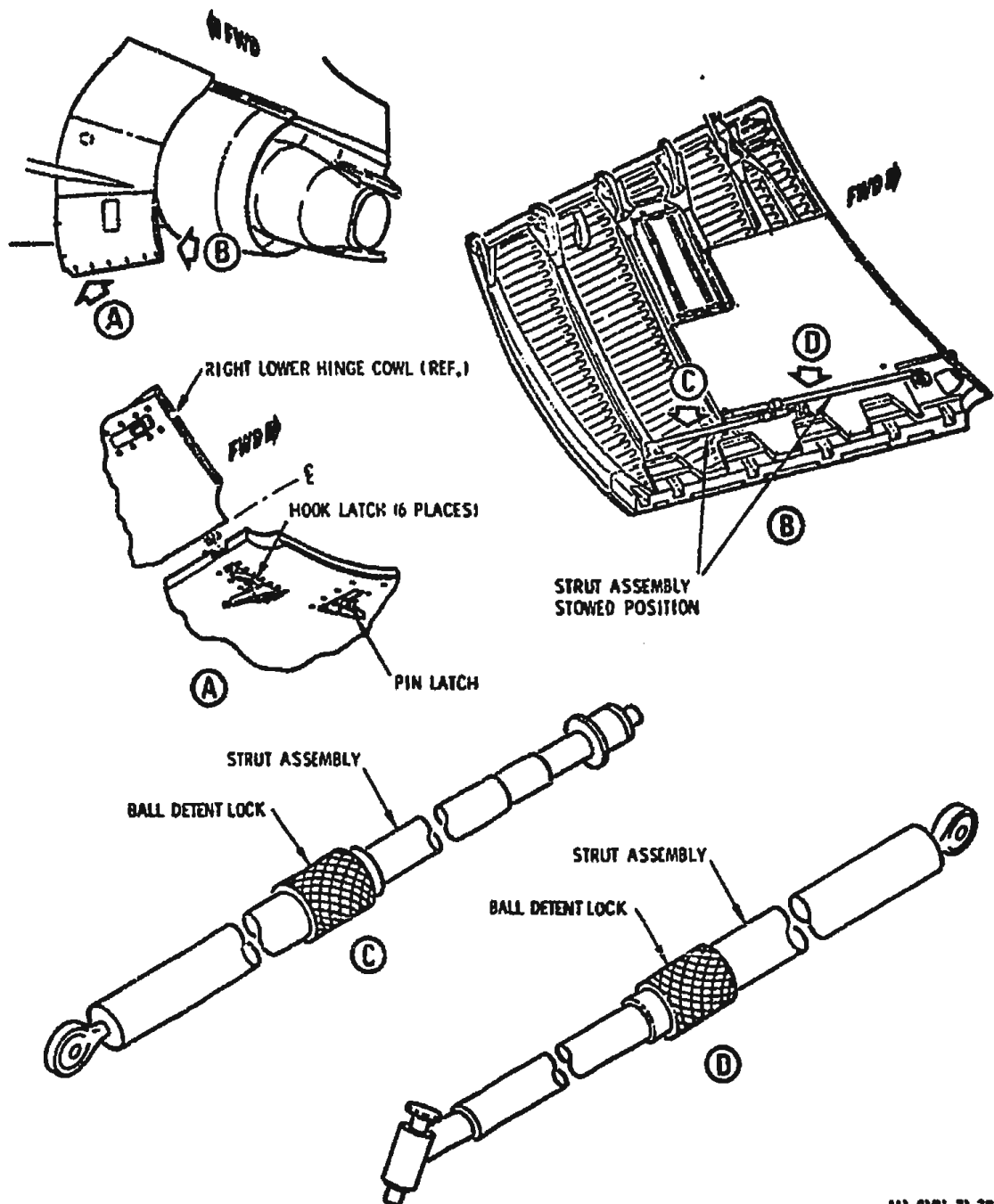
- (5) Extend the struts and lock them in the fully extended position.

EFFECTIVITY: ALL

001B

71-12-01
Page 301
May 15/90

LOCKHEED
MAINTENANCE MANUAL



M1-0101-71-301

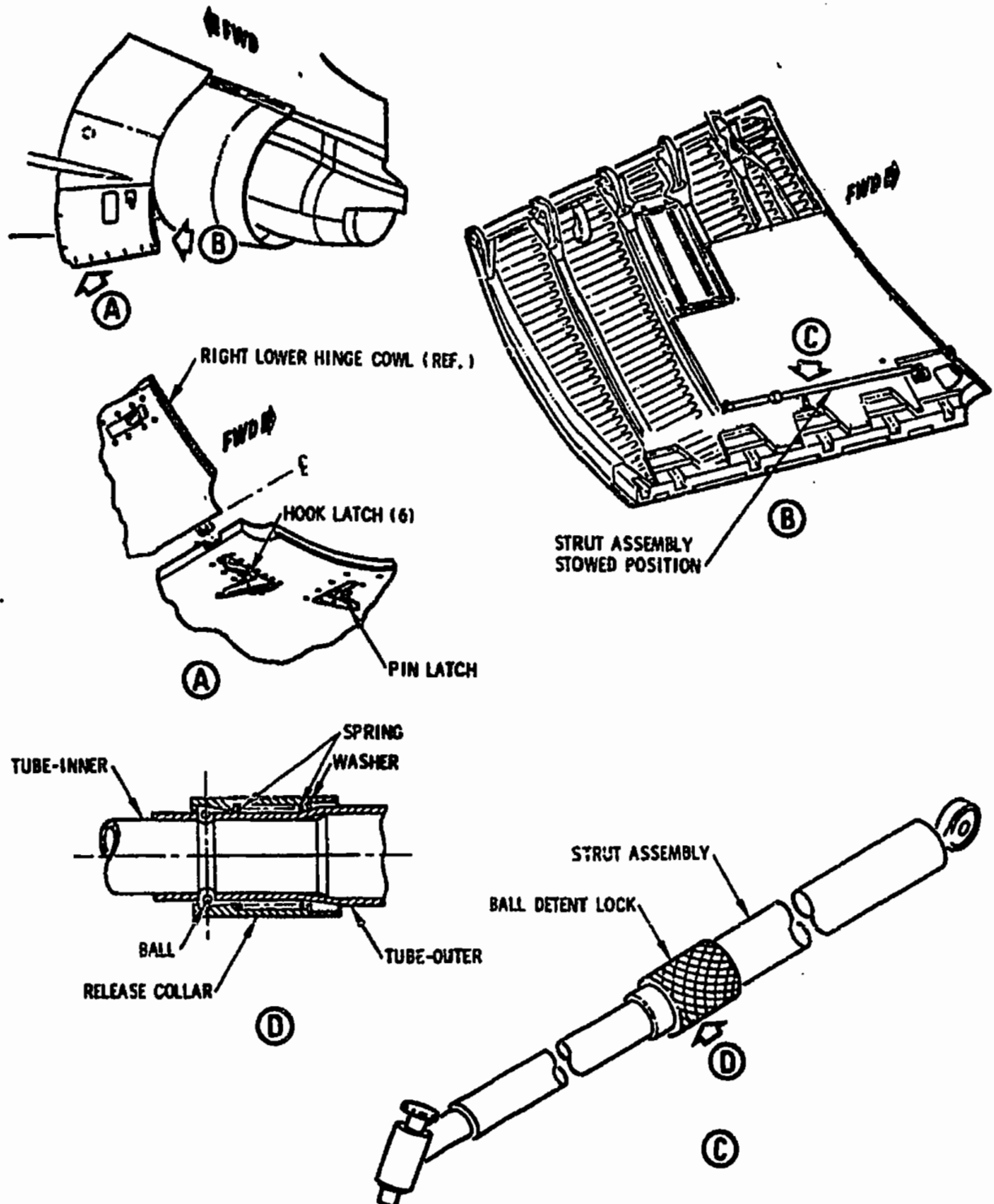
Lower Hinged Cowl Opening and Closing
Figure 301

EFFECTIVITY: 001-006

71-12-01
Page 302
May 15/77

001B

LOCKHEED
MAINTENANCE MANUAL



M1-0102-71-303

Lower Hinged Cowl Opening and Closing
Figure 301

R

EFFECTIVITY: 007-999

001B

71-12-01
Page 303
Nov 15/78

LOCKHEED
MAINTENANCE MANUAL

WARNING: THE SUPPORT STRUTS MUST BE ATTACHED SECURELY TO THE ANCHORAGE FITTING TO PREVENT INJURY.

- (6) Attach the strut to the anchorage fitting.

NOTE: The anchorage fitting for the strut is located on the lower section of the aft canted bulkhead.

- (7) Ensure that the strut is secure and locked, then release the cowl panel.

B. Close

- (1) Manually hold the cowl panel in the open position and detach the strut (Ref. Fig. 301) from the anchorage fitting.
- (2) Retract strut to stowage length (Ref. Fig. 301) and secure to stowage bracket.
- (3) On the LH lower hinged cowl, reconnect air duct hose to oil breather outlet and tighten clamp.
- (4) Carefully lower cowl panel until it hangs free.
- (5) Close the LH and RH lower hinged cowls, ensuring that the U-bolts of the RH cowl mate properly with the LH cowl.
- (6) Ensure that the rear edge of the cowl panels mate properly with the rub strip on the cowl seal assembly.
- (7) Engage and lock the forward pin latches (Ref. Fig. 301).
- (8) Engage and lock the hook-type latches along the bottom edge of the LH lower hinged cowl to the U-bolts of the RH lower hinged cowl.
- (9) Check that the cowl panels are secure and that the latches are correctly engaged and locked with a gap limit of 0.06 to 0.25 inch.

NOTE: The gap limit may be achieved by adjusting the nuts of the U-bolts as required.

R
R
001B EFFECTIVITY: ALL

71-12-01
Page 304
May 15/90

LH AND RH LOWER HINGED COWL - REMOVAL AND INSTALLATION**1. General**

The LH and RH lower hinged cowls, zones 433 and 434, for engine No. 2 provide a smooth aerodynamic fairing between the canted bulkhead firewall, zone 439, and the thrust reverser translating cowl, zone 435. The height of the working area is approximately 20 feet. The left lower hinged cowl weighs approximately 90 pounds, and the right lower hinged cowl weighs approximately 75 pounds.

Because of the cowl weight and the working height during engine removal and installation, it is necessary to use sling and hoisting equipment. A cowl panel dolly should be used for protection and handling of cowl panels.

2. Equipment and Materials

Engine No. 2 (center engine) Cowl Panel Sling, PN 1302737, or equivalent

Engine No. 2 (center engine) Cowl Panel Dolly, PN B669, or equivalent

Engine No. 2 (center engine) Workstand, PN B672, or equivalent

3. Referenced Procedures

12-21-06 Engine No. 2 Cowling Lubrication

71-12-03 LH Mid Fixed Cowl - Removal and Installation

71-12-05 LH Upper Hinged Cowl - Removal and Installation

4. Removal/Installation**A. Removal**

R **WARNING:** AVOID REMOVING OR INSTALLING LOWER HINGED COWL PANELS WHEN STRONG WINDS OR GUST CONDITIONS EXIST.

(1) Position engine No. 2 workstand (Ref. Fig. 401) for access to hinged cowl panels (Ref. Fig. 401).

NOTE: When using the sling method for removal of a lower hinged cowl panel, prior removal of the

EFFECTIVITY: ALL

001B

71-12-01
Page 401
Aug 15/81

LOCKHEED
MAINTENANCE MANUAL

upper hinged cowl panel (Ref. 71-12-05) is necessary. This permits correct placement of the sling.

- (2) Release the forward pin latch (Ref. Fig. 402) in the cowl panel, then release the hook-type latches along the bottom edge of the cowl.

NOTE: Both lower hinged cowls must be supported until all latches are disengaged.

- (3) Open both lower hinged cowls.
- (4) Attach the engine No. 2 cowl panel sling to the hoist (Ref. Fig. 403).
- (5) Lower the sling so that it passes between the engine and the mid fixed cowl.
- (6) Attach the sling to the hinge assemblies on the lower cowl as shown in Figure 403.
- (7) Raise hoist to take up all slack in sling straps.

R

- (8) On the LH lower hinged cowl, loosen clamp, disconnect air duct hose from oil breather outlet and position to one side.
- (9) Remove the attaching parts from all hinge assemblies. Retain parts for reinstallation (Ref. Fig. 402).
- (10) Lower cowl, using stabilizing tether, and place in position on cowl panel dolly (Ref. Para. 1 and Fig. 401).
- (11) Remove sling and raise hoist to clear airframe.
- (12) Proceed with removal of RH lower hinged cowl, if required, using same procedure.

B. Installation

WARNING: AVOID INSTALLING LOWER HINGED COWL PANELS WHEN STRONG WINDS OR GUST CONDITIONS EXIST.

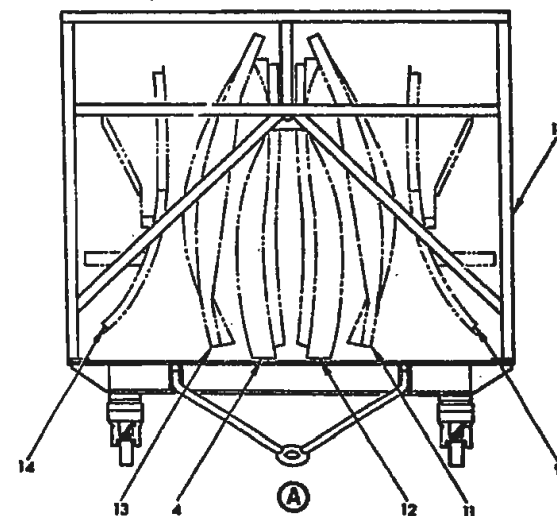
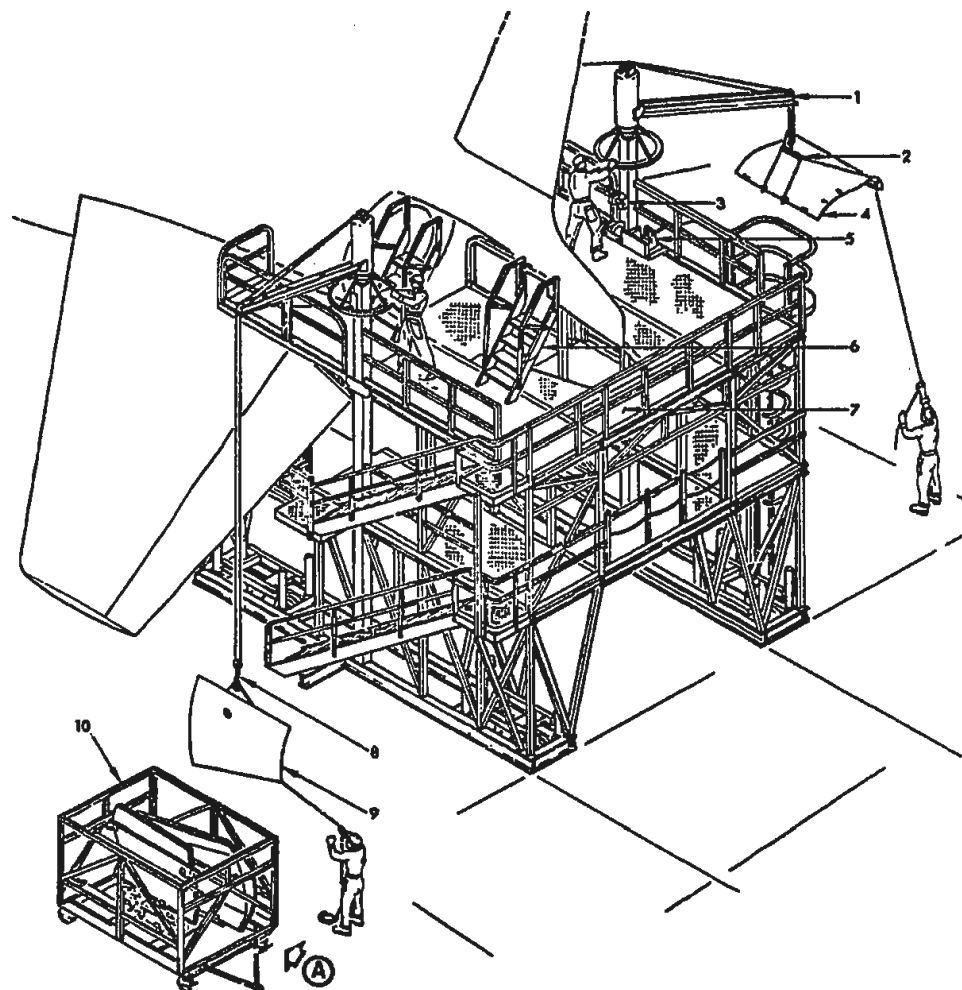
- (1) Gain access to hinged cowl panels area by placing engine No. 2 workstand in working position (Ref. Fig. 401).

NOTE: When using the sling method for installation of a lower hinged cowl panel, prior installation of the mid fixed cowl panel (Ref. 71-12-03) is

EFFECTIVITY: ALL

71-12-01
Page 402
May 15/88

001B



- 1 HOIST (2)
- 2 ENGINE NO. 2 (CENTER ENGINE) UPPER HINGED COWL PANEL SLING
- 3 HAND WINCH (PART OF HOIST)
- 4 RH UPPER HINGED COWL
- 5 AIR WINCH (PART OF HOIST)
- 6 EXTENSION LADDER AND RISER (4)
- 7 ENGINE NO. 2 (CENTER ENGINE) WORKSTAND
- 8 ENGINE NO. 2 (CENTER ENGINE) MID AND LOWER COWL PANEL SLING
- 9 LH MID FIXED COWL
- 10 ENGINE NO. 2 (CENTER ENGINE) COWL PANELS DOLLY
- 11 LH LOWER HINGED COWL
- 12 LH UPPER HINGED COWL
- 13 RH LOWER HINGED COWL
- 14 RH MID FIXED COWL

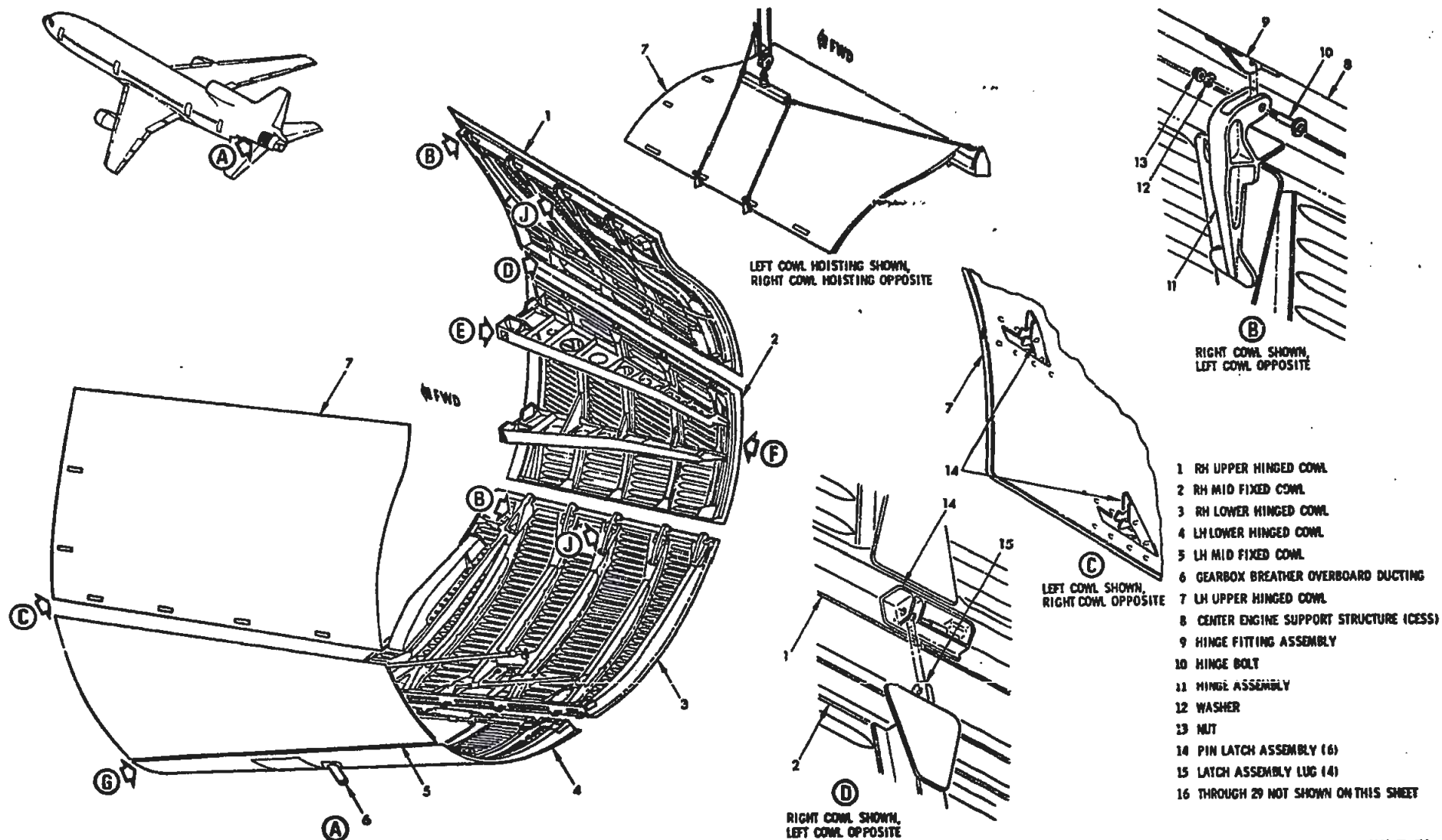
G 858
M1-9100-71-46

Cowl Panel Removal and Installation Equipment
Figure 401

EFFECTIVITY: ALL

001B

71-12-01
Page 403/404
May 15/77



ML-0103-71-436

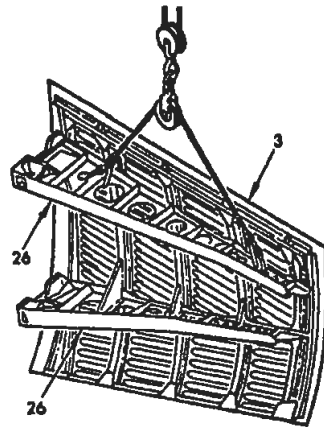
R
R

Upper, Mid and Lower Cowl Panels
Figure 402 (Sheet 1)

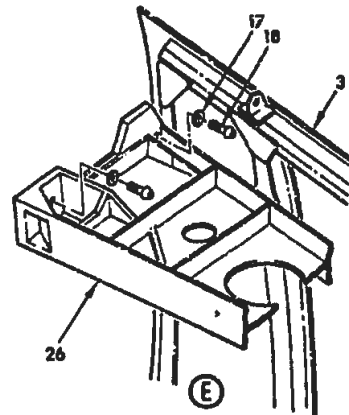
EFFECTIVITY: ALL

001B

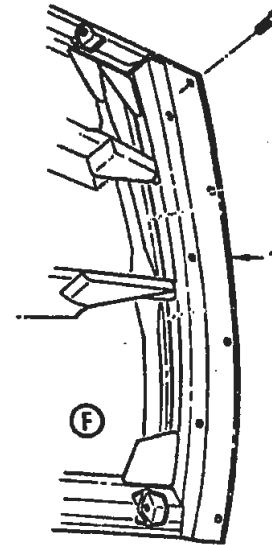
71-12-01
Page 405/406
May 15/77



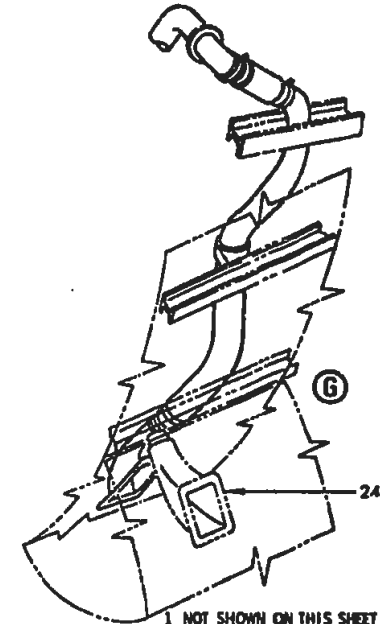
RIGHT COWL HOISTING SHOWN,
LEFT COWL HOISTING OPPOSITE



RIGHT COWL SHOWN

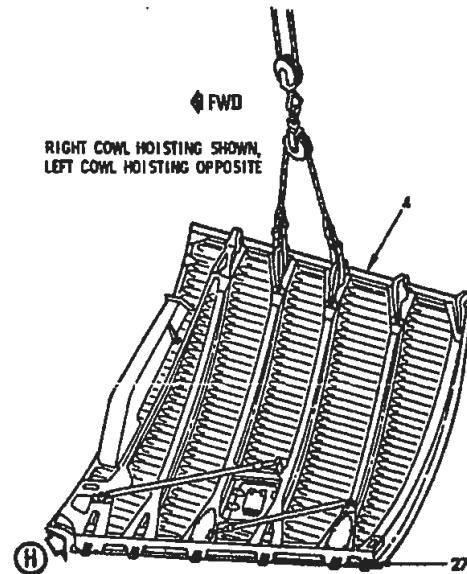


RIGHT COWL SHOWN,
LEFT COWL OPPOSITE

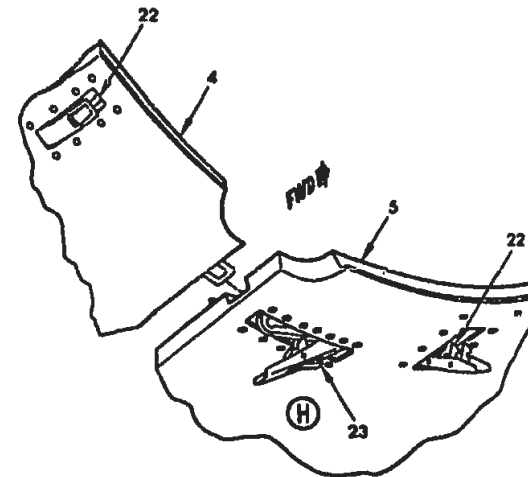
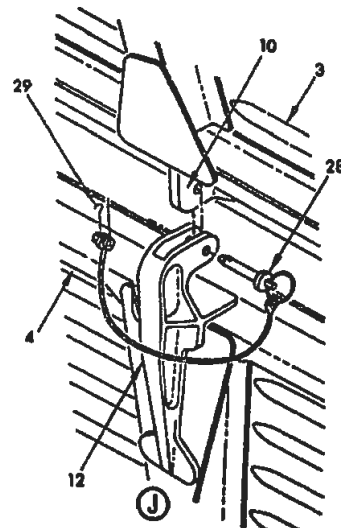


- 1 NOT SHOWN ON THIS SHEET
- 2 NOT SHOWN ON THIS SHEET
- 3 RH MID FIXED COWL
- 4 RH LOWER HINGED COWL
- 5 LH LOWER HINGED COWL
- 6 NOT SHOWN ON THIS SHEET
- 7 GEARBOX BREATHER OVERBOARD DUCTING
- 8 AND 9 NOT SHOWN ON THIS SHEET
- 10 HINGE FITTING ASSEMBLY
- 11 NOT SHOWN ON THIS SHEET
- 12 HINGE ASSEMBLY (S)
- 13 NOT SHOWN ON THIS SHEET
- 14 NOT SHOWN ON THIS SHEET
- 15 AND 16 NOT SHOWN ON THIS SHEET
- 17 WASHER (4)
- 18 BEAM ATTACH BOLT (4)
- 19 NOT SHOWN ON THIS SHEET
- 20 NOT SHOWN ON THIS SHEET
- 21 TRIWING BOLT (7)
- 22 PIN LATCH ASSEMBLY
- 23 LATCH ASSEMBLY
- 24 OIL BREATHER OUTLET DUCT
- 25 NOT SHOWN ON THIS SHEET
- 26 COWL BEAM
- 27 U-BOLT (6)
- 28 RETAINER PIN
- 29 PIN

M1-0103-71-430



RIGHT COWL HOISTING SHOWN,
LEFT COWL HOISTING OPPOSITE



R
R

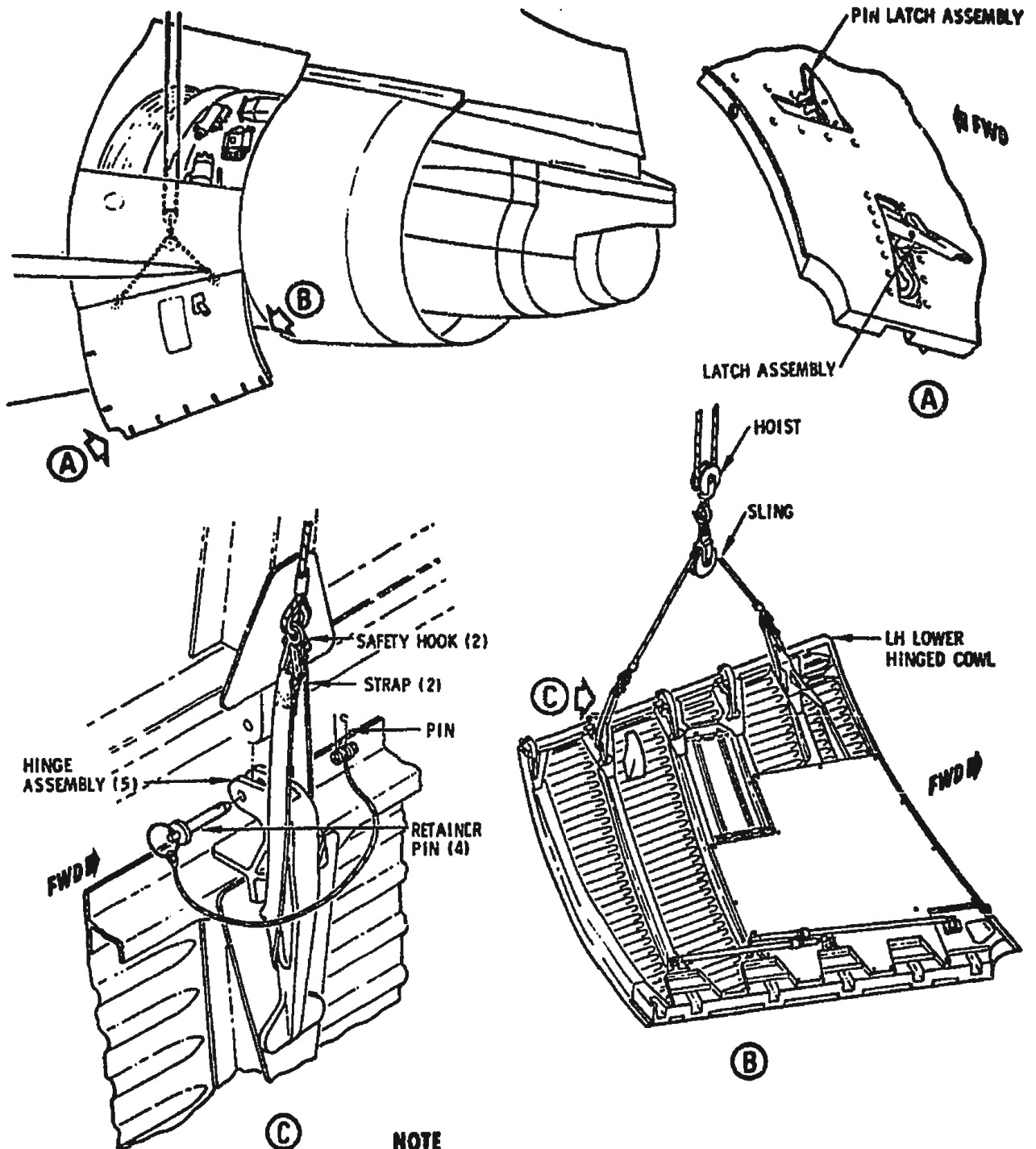
Upper, Mid and Lower Cowl Panels
Figure 402 (Sheet 2)

EFFECTIVITY: ALL

001B

71-12-01
Page 407/408
May 15/77

LOCKHEED
MAINTENANCE MANUAL



M1-0102-71-441

R
R

Lower Hinged Cowl - Removal and Installation
Figure 403

EFFECTIVITY: ALL

001B

71-12-01
Page 409
May 15/77



MAINTENANCE MANUAL

necessary. This establishes the attachment points for the lower hinged cowl.

- (2) Lower hoist cables between engine and the LH mid fixed cowl until cowl panel sling can be attached to hoist hooks (Ref. Fig. 403).
- (3) Attach sling to LH lower hinged cowl located on cowl panel dolly as shown on Fig. 401.
- (4) Using a stabilizing tether, raise cowl into position for attachment to mid fixed cowl.
- (5) Install hinge assembly attaching parts as shown in Fig. 402.
- R (6) On the LH lower hinged cowl, reconnect air duct hose to oil breather outlet and tighten clamp.
- (7) Disconnect sling from cowl panel, and remove from hoist. Raise hoist to clear airframe.
- (8) Lubricate front hinge assemblies (Ref. 12-21-06).
- (9) If the RH lower hinged cowl is not installed, perform Steps 4B(1) through 4B(8) to install that component.
- (10) Close the LH and RH lower hinged cowls ensuring that the U-bolts of the RH cowl mate properly with the LH cowl.
- (11) Ensure that the rear edge of the cowl panels mate properly with the rub strip on the cowl seal assembly.
- (12) Engage and lock forward pin latch.
- (13) Engage and lock the hook-type latches along the bottom edge of the LH lower hinged cowl to the U-bolts of the RH lower hinged cowl.
- (14) Verify that the cowl panels are secure and that the latches are correctly engaged and locked with a gap limit of 0.06 to 0.25 inch.

NOTE: The gap limit may be achieved by adjusting the nuts of the U-bolts as required.

- (15) Remove workstand.

EFFECTIVITY: ALL

001B

71-12-01
Page 410
May 15/88

LH AND RH MID FIXED COWLS - REMOVAL AND INSTALLATION**1. General**

The LH and RH mid fixed cowls, zones 433 and 434, for engine No. 2 provide a smooth aerodynamic fairing between the canted bulkhead firewall, zone 439, and the thrust reverser translating cowl, zone 435. The height of the working area is approximately 22 feet. Each mid fixed cowl weighs approximately 100 pounds.

- R Due to the cowl weight and the working height during removal and installation, it is necessary to use a sling and hoisting equipment. A cowl panel dolly should be used for protection and handling of cowl panels.

2. Equipment and Materials

Engine No. 2 Cowl Panel Sling, PN 1302737, or equivalent

Engine No. 2 Cowl Panel Dolly, PN B669, or equivalent

Engine No. 2 Workstand, PN B672, or equivalent

3. Referenced Procedures

20-36-02 Double T-bolt V-band Coupling - Removal and Installation

71-12-01 LH and RH Lower Hinged Cowls - Removal and Installation

71-12-05 LH and RH Upper Hinged Cowls - Removal and Installation

4. Removal/Installation**A. Removal**

WARNING: AVOID REMOVING OR INSTALLING MID FIXED COWL PANELS WHEN STRONG WINDS OR GUST CONDITION EXIST.

- (1) Position engine No. 2 workstand (Ref. 71-12-01, Fig. 401) for access to mid fixed cowl panels.

NOTE: Removal of a mid fixed cowl panel requires prior removal of the upper hinged cowl (Ref. 71-12-05) and of the lower hinged cowl (Ref. 71-12-01).

EFFECTIVITY: ALL



MAINTENANCE MANUAL

- (2) On aircraft 001-014,
remove the applicable double T-bolt V-band coupling
(Ref. 20-36-02) that connects the centrifugal breather
outlet duct or fuel drains tank overboard vent (Ref.
71-12-01, Fig. 402).
- (2) On aircraft 015-999,
left cowl only, remove double T-bolt V-band coupling
(Ref. 20-36-02) that connects the centrifugal breather
outlet duct (Ref. 71-12-01, Fig. 402).
- (3) Attach the engine No. 2 cowl panel sling to the hoist
(Ref. Fig. 401) and to the cowl panel beam.
- (4) Raise hoist to take up all slack in the sling straps.
- (5) Remove the attaching parts holding the cowl panel to
the engine No. 2 cowl seal assembly (Ref. 71-12-01,
Fig. 402). Retain parts for reinstallation.
- (6) Open upper beam access panel (Ref. Fig. 401) and remove
attaching parts holding the upper and lower beams to
the aft canted bulkhead. Retain parts for
reinstallation.

R
R
R

NOTE: Replace barrel nuts if panel attach bolts do not
meet a back-off breakaway torque of at least 32
lb in.

- (7) Lower cowl panel, using stabilizing tether, and place
in position on cowl panel dolly (Ref. Fig. 401).
- (8) Remove sling and tether, and raise hoist to clear
airframe.
- (9) Inspect exposed surface of V-flange seal (E-seal) in
flange of applicable centrifugal breather outlet duct
or fuel drains tank overboard vent for deformation,
nicks, dents, or tears. Replace the seal if damaged.

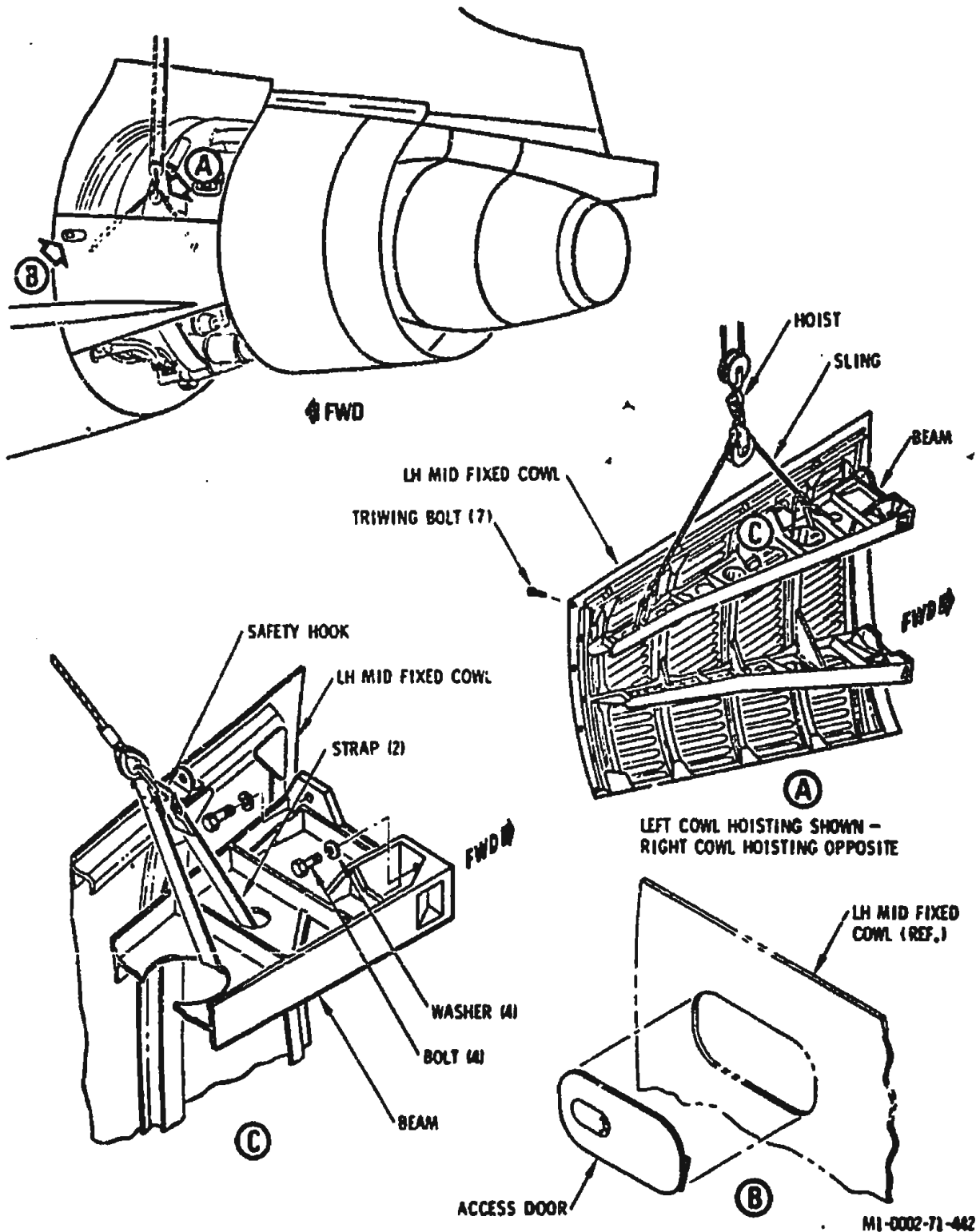
NOTE: E-seals are manufactured slightly out-of-round
for secure fit in male portion of ducting
joints. Most common defects will be nicks,
dents, cuts, or deformation from flat plane. Do
not remove any seal for inspection if it appears
to be in satisfactory condition.
- (10) Place dust cover over flange of applicable centrifugal
breather outlet duct or fuel drains tank overboard
vent.

EFFECTIVITY: ALL

001B

71-12-03
Page 402
Aug 15/82

LOCKHEED
MAINTENANCE MANUAL



R
R

Mid Fixed Cowl - Removal and Installation
Figure 401

EFFECTIVITY: ALL

001B

71-12-03
Page 403
Aug 15/81

LOCKHEED
MAINTENANCE MANUAL

- (11) Proceed with removal of opposite mid fixed cowl, if required, using same procedure.

B. Installation

WARNING: AVOID INSTALLING MID FIXED COWL PANELS WHEN STRONG WINDS OR GUST CONDITIONS EXIST.

- (1) Gain access to mid fixed cowl panels by placing engine No. 2 workstand in working position (Ref. 71-12-01, Fig. 401).
- (2) Attach the engine No. 2 cowl panel sling to the hoist (Ref. Fig. 401).
- (3) Attach the sling to the cowl panel beam (Ref. Fig. 401) and remove applicable duct dust cover.
- (4) Using a stabilizing tether, raise cowl panel into position for attachment to the firewall canted bulkhead, zone 439.
- (5) Install attaching parts to attach cowl panel to firewall canted bulkhead (Ref. 71-12-01, Fig. 402) and to engine No. 2 cowl seal assembly. Ensure that access panel is closed and latched.
- (6) Disconnect sling and tether from cowl panel beam, and remove sling from hoist. Raise hoist to clear airframe.
- (7) On aircraft 001-014, install the applicable double T-bolt V-band coupling (Ref. 20-36-02) that connects the centrifugal breather outlet duct or fuel drains tank overboard vent (Ref. 71-12-01, Fig. 402).
- (7) On aircraft 015-999, left cowl only, install double T-bolt V-band coupling (Ref. 20-36-02) that connects the centrifugal breather outlet duct (Ref. 71-12-01, Fig. 402).
- (8) Proceed with installation of opposite mid fixed cowl panel, if required, using the same procedure.

LOCKHEED
MAINTENANCE MANUAL

LH AND RH UPPER HINGED COWLS - SERVICING

1. General

The following procedure applies when opening or closing either the LH or RH upper hinged cowl.

2. Equipment and Materials

Engine No. 2 Workstand, PN B 672, or equivalent

3. Open/Close

WARNING: AVOID OPENING UPPER HINGED COWL PANELS WHEN STRONG WIND OR GUST CONDITIONS EXIST.

A. Open

- (1) Position a workstand for access to the cowling to be opened.
- (2) Release the pin latches (Ref. Fig. 301), zone 433 or 434, along the front edge of the cowl panel.
- (3) Release the pin latch assemblies along the bottom edge of the cowl panel.
- (4) Open the cowl panel.
- (5) Hold the cowl panel open from the inside and release the cowl panel strut assemblies (Ref. Fig. 301) from their brackets.

WARNING: THE COLLAR RELEASE AND BALL MUST BE SECURELY LOCKED TO PREVENT INJURY.

- (6) Extend the struts and lock them in the fully extended position.

WARNING: THE SUPPORT STRUCTS MUST BE ATTACHED SECURELY TO THE LATCH LUGS TO PREVENT INJURY.

- (7) Attach the struts to the front and rear latch lugs on the mid fixed cowl.
- (8) Ensure that the struts are secure and locked, then release the cowl panel.

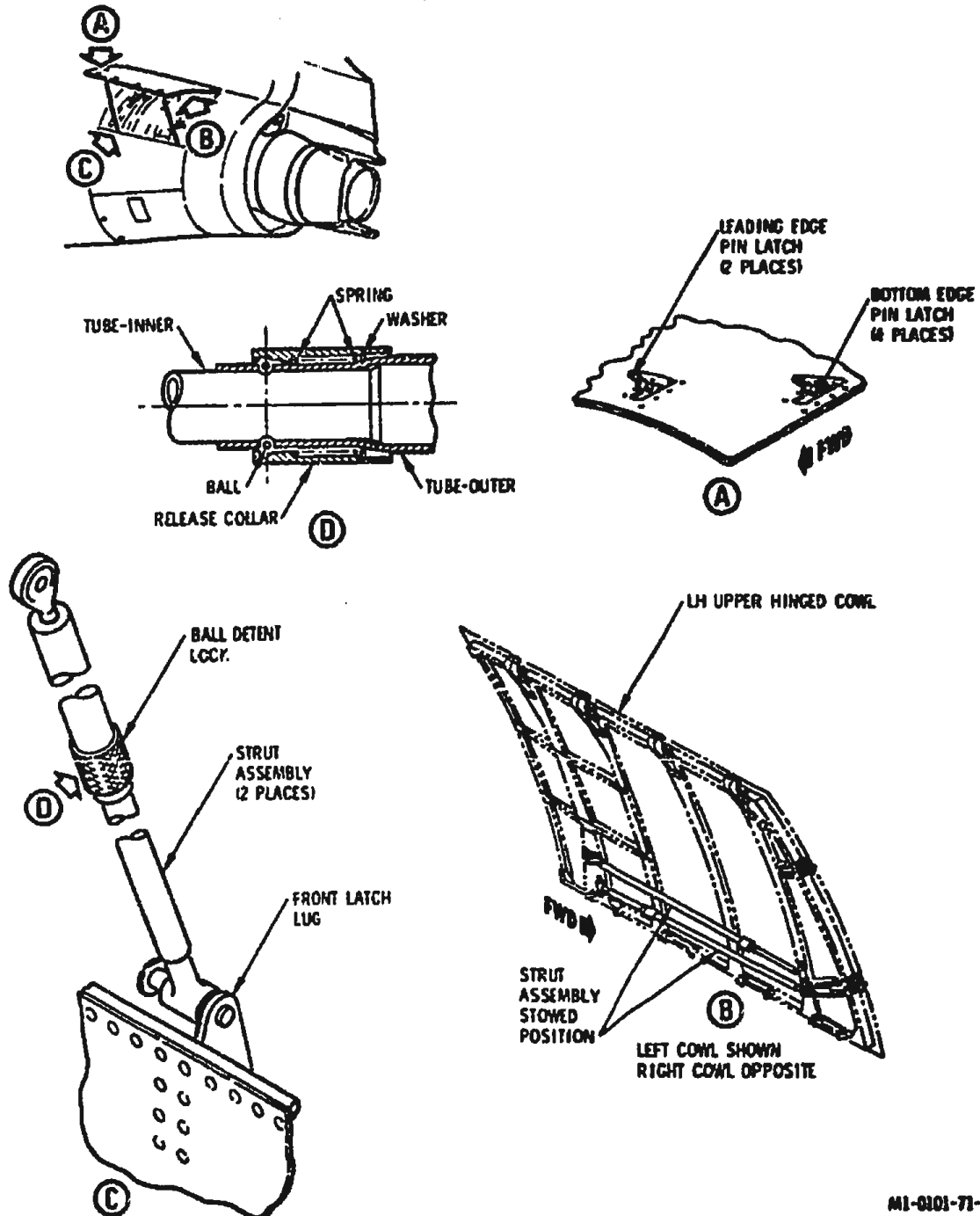
EFFECTIVITY: ALL

001B

71-12-05

Page 301
May 15/77

LOCKHEED
MAINTENANCE MANUAL



MI-0101-71-302

R
R

Upper Hinged Cowl Opening and Closing
Figure 301

EFFECTIVITY: ALL

001B

71-12-05
Page 302
Mar 15/80

LOCKHEED
MAINTENANCE MANUAL

B. Close

- (1) Manually hold the cowl panel in the open position and detach the struts (Ref. Fig. 301) from the latch lugs.
- (2) Retract struts to stowage length and secure the struts to the stowage brackets.
- (3) Carefully lower the cowl panel until it rests against the mid fixed cowl panel.
- (4) Ensure that the rear edge of the cowl panel mates properly with the rub strip on the cowl seal assembly.
- (5) Engage and lock the forward pin latches (Ref. Fig. 301) to the aft canted bulkhead.
- (6) Engage and lock the pin latches along the bottom edge of the panel to the latch lugs on the mid fixed cowl.
- (7) Check that the cowl panel is secure and that the latches are correctly engaged and locked.
- (8) Remove workstand from immediate area of the aircraft.

EFFECTIVITY: ALL

001B

71-12-05
Page 303/304
May 15/77

LOCKHEED
MAINTENANCE MANUAL

LH AND RH UPPER HINGED COWL - REMOVAL AND INSTALLATION

1. General

The LH and RH upper hinged cowls, zones 433 and 434, for engine No. 2 provide a smooth aerodynamic fairing between the canted bulkhead firewall, zones 439, and the thrust reverser translating cowl, zone 435. The height of the working area is approximately 25 feet. Each upper hinged cowl weighs approximately 66 pounds.

Because of the cowl weight and the working height during removal and installation, it is necessary to use sling and hoisting equipment. A cowl panel dolly should be used for protection and handling of cowl panels.

2. Equipment and Materials

Engine No. 2 (center engine) Upper Cowl Panel Sling, PN 1302738, or equivalent

Engine No. 2 (center engine) Cowl Panel Dolly, PN B669, or equivalent

Engine No. 2 (center engine) Workstand, PN B672, or equivalent

3. Referenced Procedure

12-21-06 Engine No. 2 Cowling Lubrication

4. Removal/Installation

A. Removal

R **WARNING:** AVOID REMOVING OR INSTALLING LOWER HINGED COWL PANELS WHEN STRONG WINDS OR GUST CONDITIONS EXIST.

- (1) Position engine No. 2 (center engine) workstand (Ref. Fig. 401) for access to lower hinged cowl panels.
- (2) Release the pin latches (Ref. Fig. 402) on the front edge of the cowl panel, then release the pin latches along the lower edge of the cowl.
- (3) Open the cowl panel and secure the panel in the open position (Ref. Fig. 403) with the strut assemblies.

EFFECTIVITY: ALL

0018

71-12-05
Page 401
Aug 15/81



- (4) Attach the engine No. 2 upper cowl panel sling to the hoist.
- (5) Attach the sling to the hinge assemblies and the cowl pin latches.
- (6) Raise hoist to take up all slack in sling cables.
- (7) Release and stow the strut assemblies.
- (8) Remove the attaching parts (Ref. Fig. 402) from all hinge assemblies. Retain parts for installation.
- (9) Lower cowl, using stabilizing tether, and place in position on cowl panel dolly (Ref. Fig. 403).
- (10) Remove sling and tether from cowl panel, and proceed with removal of opposite hinged cowl, if required, using same procedure.

B. Installation

R

WARNING: AVOID INSTALLING UPPER HINGED COWL PANELS WHEN STRONG WINDS OR GUST CONDITIONS EXIST.

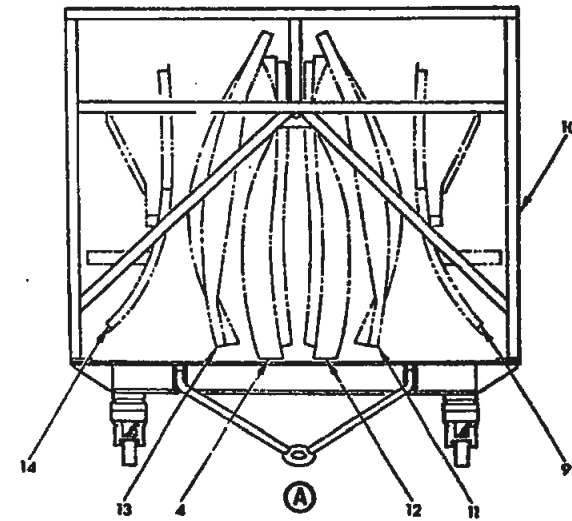
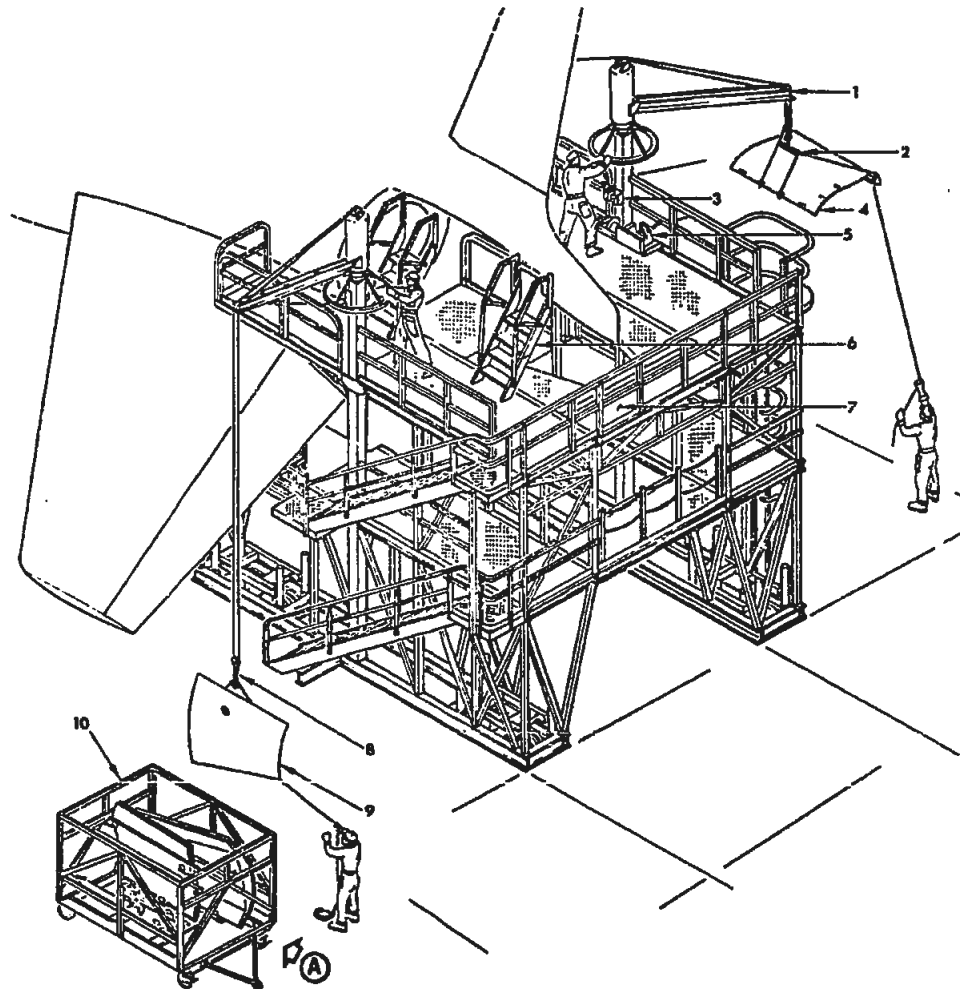
- (1) Gain access to hinged cowl panels by placing engine No. 2 workstand in working position (Ref. Fig. 401).
- (2) Attach the engine No. 2 upper cowl panel sling to the hoist (Ref. Fig. 401).
- (3) Attach the sling to the hinge assemblies and the cowl pin latches (Ref. Fig. 401).
- (4) Using a stabilizing tether, raise cowl into position for attachment to the center engine support structure.
- (5) Install hinge assembly attaching parts as follows (Ref. Fig. 402):
 - (a) Install forward hinge bolt.
 - (b) Install rear hinge retainer pin.
 - (c) Install remaining hinge retainer pins aligning the hinge assemblies by rotating the cowl.
- (6) Secure the panel in the open position with the strut assemblies (Ref. Fig. 401).
- (7) Disconnect sling from cowl panel. Remove sling and tether from hoist. Raise hoist to clear airframe.

EFFECTIVITY: ALL

0018

71-12-05

Page 402
Aug 15/81



- 1 HOIST (2)
- 2 ENGINE NO. 2 (CENTER ENGINE) UPPER HINGED COWL PANEL SLING
- 3 HAND WINCH (PART OF HOIST)
- 4 RH UPPER HINGED COWL
- 5 AIR WINCH (PART OF HOIST)
- 6 EXTENSION LADDER AND RISER (4)
- 7 ENGINE NO. 2 (CENTER ENGINE) WORKSTAND
- 8 ENGINE NO. 2 (CENTER ENGINE) MID AND LOWER COWL PANEL SLING
- 9 LH MID FIXED COWL
- 10 ENGINE NO. 2 (CENTER ENGINE) COWL PANELS DOLLY
- 11 LH LOWER HINGED COWL
- 12 LH UPPER HINGED COWL
- 13 RH LOWER HINGED COWL
- 14 RH MID FIXED COWL

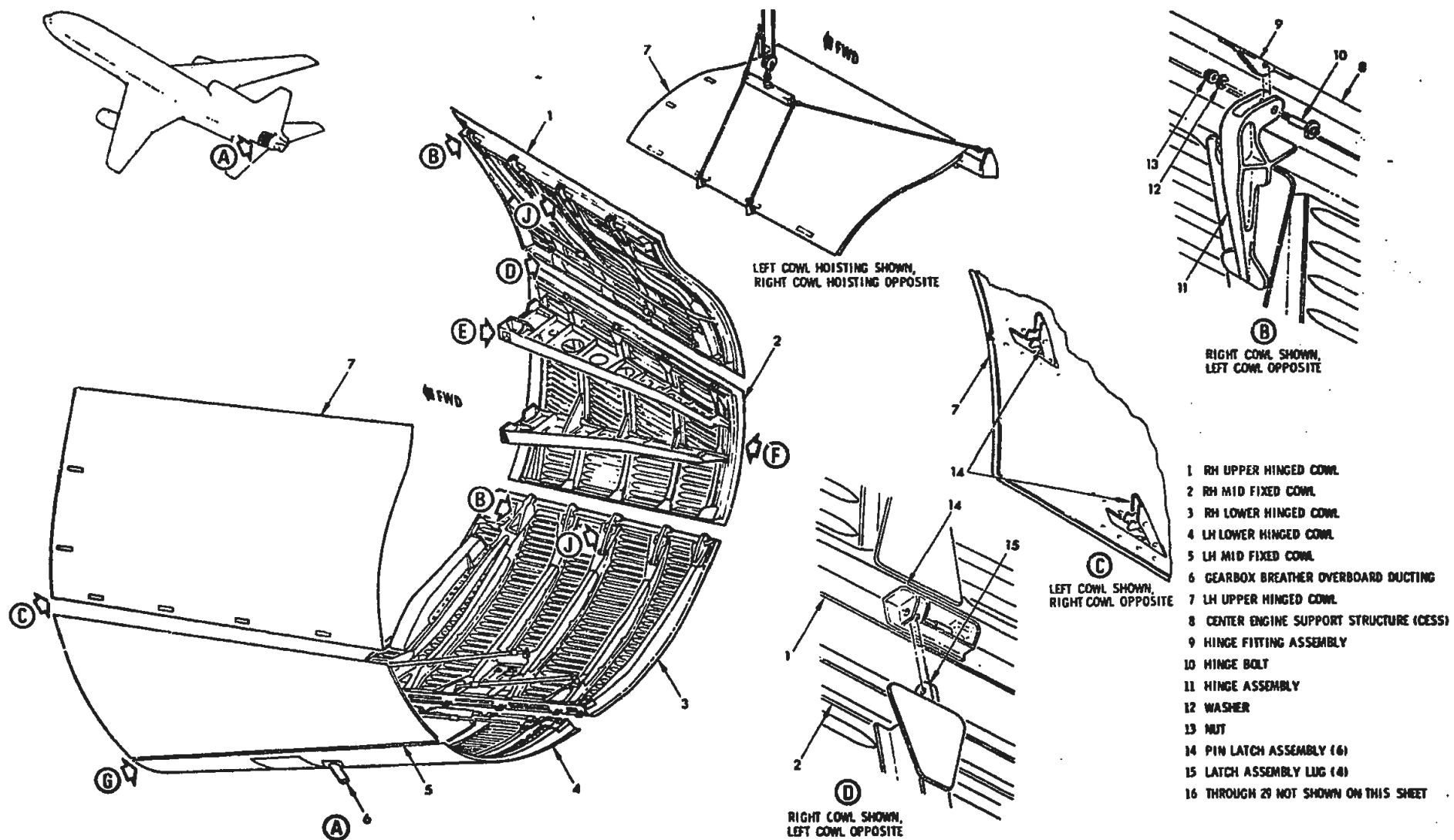
Removal and Installation Equipment
Figure 401

EFFECTIVITY: ALL

001B

71-12-05
Page 403/404
May 15/77

G 858
M1-0100-71-46



M1-8103-71-416

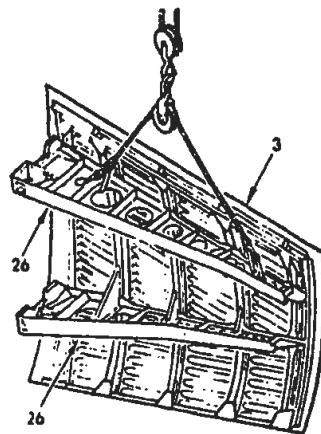
Cowl Panels
Figure 402 (Sheet 1)

71-12-05
Page 405/406
May 15/77

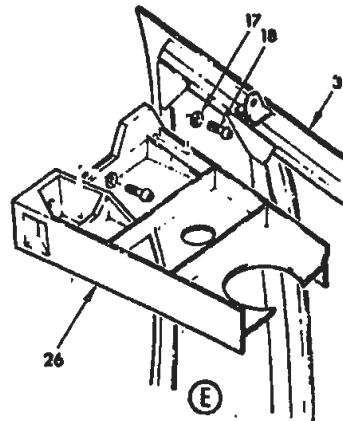
R
R

EFFECTIVITY: ALL

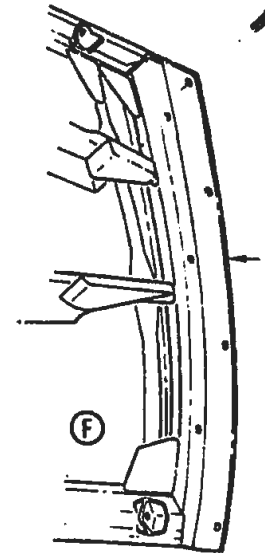
001B



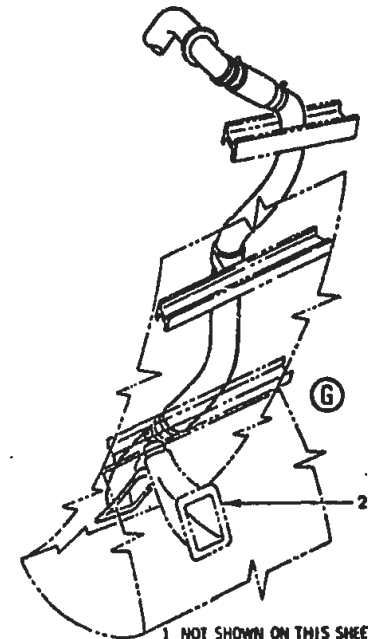
RIGHT COWL HOISTING SHOWN,
LEFT COWL HOISTING OPPOSITE



RIGHT COWL SHOWN

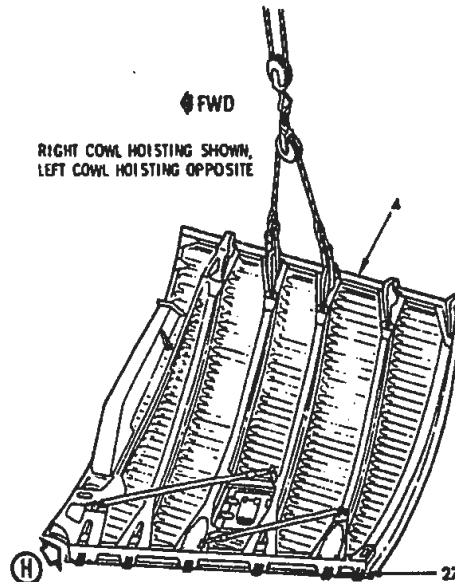


RIGHT COWL SHOWN,
LEFT COWL OPPOSITE

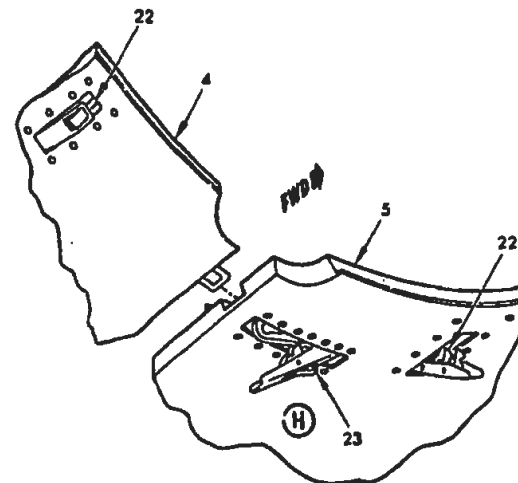
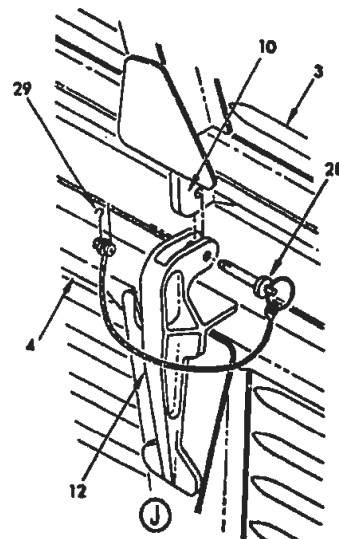


- 1 NOT SHOWN ON THIS SHEET
- 2 NOT SHOWN ON THIS SHEET
- 3 RH MID FIXED COWL
- 4 RH LOWER HINGED COWL
- 5 LH LOWER HINGED COWL
- 6 NOT SHOWN ON THIS SHEET
- 7 GEARBOX BREATHER OVERBOARD DUCTING
- 8 AND 9 NOT SHOWN ON THIS SHEET
- 10 HINGE FITTING ASSEMBLY
- 11 NOT SHOWN ON THIS SHEET
- 12 HINGE ASSEMBLY (5)
- 13 NOT SHOWN ON THIS SHEET
- 14 NOT SHOWN ON THIS SHEET
- 15 AND 16 NOT SHOWN ON THIS SHEET
- 17 WASHER (4)
- 18 BEAM ATTACH BOLT (4)
- 19 NOT SHOWN ON THIS SHEET
- 20 NOT SHOWN ON THIS SHEET
- 21 TRUING BOLT (7)
- 22 PIN LATCH ASSEMBLY
- 23 LATCH ASSEMBLY
- 24 OIL BREATHER OUTLET DUCT
- 25 NOT SHOWN ON THIS SHEET
- 26 COWL BEAM
- 27 U-BOLT (6)
- 28 RETAINER PIN
- 29 PIN

MI-0103-71-000

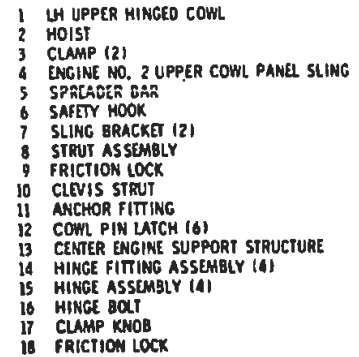


RIGHT COWL HOISTING SHOWN,
LEFT COWL HOISTING OPPOSITE



Cowl Panels
Figure 402 (Sheet 2)

EFFECTIVITY: ALL



RR

EFFECTIVITY: ALL

Aug 15/81

LOCKHEED
MAINTENANCE MANUAL

- (8) Lubricate hinge assemblies (Ref. 12-21-06).
- (9) Close upper hinged cowl panel, engage pin latches along bottom edge of hinged cowl, and verify that rear edge of cowl mates with rubstrip on cowl seal assembly.
- (10) Engage and lock cowl panel forward pin latches.
- (11) Proceed with installation of opposite hinged cowl, if necessary, using same procedure.
- (12) Remove workstand.

EFFECTIVITY: ALL

001B

71-12-05
Page 411/412
May 15/77

AIR INTAKE ADAPTER - REMOVAL AND INSTALLATION1. General

The air intake (S-duct) adapter, zone 431, is a section of transition ducting installed between engine No. 2, zone 432, and the S-duct, zone 312. The adapter bolts to front flange of the engine low-pressure compressor case (fan case) and to the rear flange of the S-duct. Major components of the adapter are the adapter slip joint cone, adapter segment assembly and the hinged access door.

2. Equipment and Materials

Engine No. 2 Workstand PN B672, or equivalent

Air Intake Adapter Sling Assembly, PN BG34, or equivalent

Air Intake Adapter Dolly, PN B676, or equivalent

Portable Hoist, PN WE 3981, or equivalent

Containers (approved for fuel, oil, and hydraulic fluids)

Protective Caps

Lock-wire, Fed Spec QQ-W-390, 0.032-inch diameter, or equivalent

3. Referenced Procedures

20-36-02 Double T-bolt V-band Coupling - Removal and Installation

24-41-00 External Power/Ground Service System - Maintenance Practices

29-11-00 Hydraulic Power System - Maintenance Practices

71-00-03 Fuselage-Mounted QEC Unit - Removal and Installation

71-12-01 LH and RH Lower Hinged Cowl - Servicing

71-12-05 LH and RH Upper Hinged Cowl - Servicing

71-12-07 Air Intake Adapter - Inspection and Check



72-31-03 Compressor Spinner and Anti-icing Tubes - Removal and Installation

4. Removal/Installation

A. Removal

- (1) Position workstand for access to the work area.
- (2) On Flight Engineer/Second Officers aft circuit breaker panel CB3, zone 215, open and tag circuit breaker PROXIMITY SWITCH 2 (H3).
- (3) Turn on electrical power (Ref. 24-41-00) and hydraulic system A pressure (Ref. 29-11-00).
- (4) Open panel 318BA and place the tailskid ground service switch to RETRACT position. Verify that tailskid retracts (Ref. 32-71-00).

NOTE: Verify that the warning flag for the tailskid switch is visible.
- (5) Turn off electrical power (Ref. 24-41-00) and hydraulic system A pressure (Ref. 29-11-00). (6) Open LH and RH upper hinged cowl (Ref. 71-12-05).
- (7) Open LH and RH lower hinged cowl (Ref. 71-12-01). Support cowl in open position allowing clearance for removal of air intake adapter.
- (8) Disconnect the B1 and C1 pump hydraulic lines at the self-sealing disconnects (Ref. Fig. 401) and install protective caps.
- (9) Drain fuel from fuel supply line into a container by removing the drain plug (Ref. Fig. 402). Reinstall drain plug and lock-wire.
- (10) Disconnect fuel line, install protective caps, and support fuel line to prevent kinking or damage.
- (11) Remove double T-bolt V-band coupling (Ref. 20-36-02) to separate starter control valve from downstream starter ducting (Ref. Fig. 403).
- (12) Remove double T-bolt V-band coupling to separate engine starter from starter duct and remove duct section.

LOCKHEED



MAINTENANCE MANUAL

- R
- (13) Remove LP compressor spinner and anti-icing tube (Ref. 72-31-03). Secure spinner and tube in S-duct for temporary stowage.
 - (14) Disconnect proximity switches and wire harness from air intake adapter access door.
 - (15) Disconnect P1 probe tube assembly and disconnect clamps from adapter (Ref. Fig. 404).
 - (16) Loosen fire detector loop clamps at aft canted bulkhead to allow moving loop for clearance during removal of air intake adapter.
 - (17) Attach air intake adapter sling to adapter (Ref. Fig. 405).
 - (18) Install davit assemblies in applicable mid fixed coral beam holes, centering davits with air intake adapter (Ref. Fig. 406); attach portable hoists to davit assembly arms.
 - (19) Unwind hoist cables and attach to adapter sling end fittings. Take weight of adapter on hoist, positioning davit arms and hoists for a vertical load.
 - (20) Remove bolts and washers holding air intake adapter rear flange to engine low-pressure compressor case.
 - (21) Remove bolts and washers holding air intake adapter front flange to S-duct.
- NOTE: It may be necessary to lower the air intake adapter slightly to relieve S-duct load for removal of bolts.
- (22) Compress adapter slip joint and lower adapter carefully ensuring clearance between adapter and all attaching parts.
 - (23) Place and secure adapter in adapter dolly (Ref. Fig. 407).
 - (24) Remove hoists and sling from adapter.

B. Installation

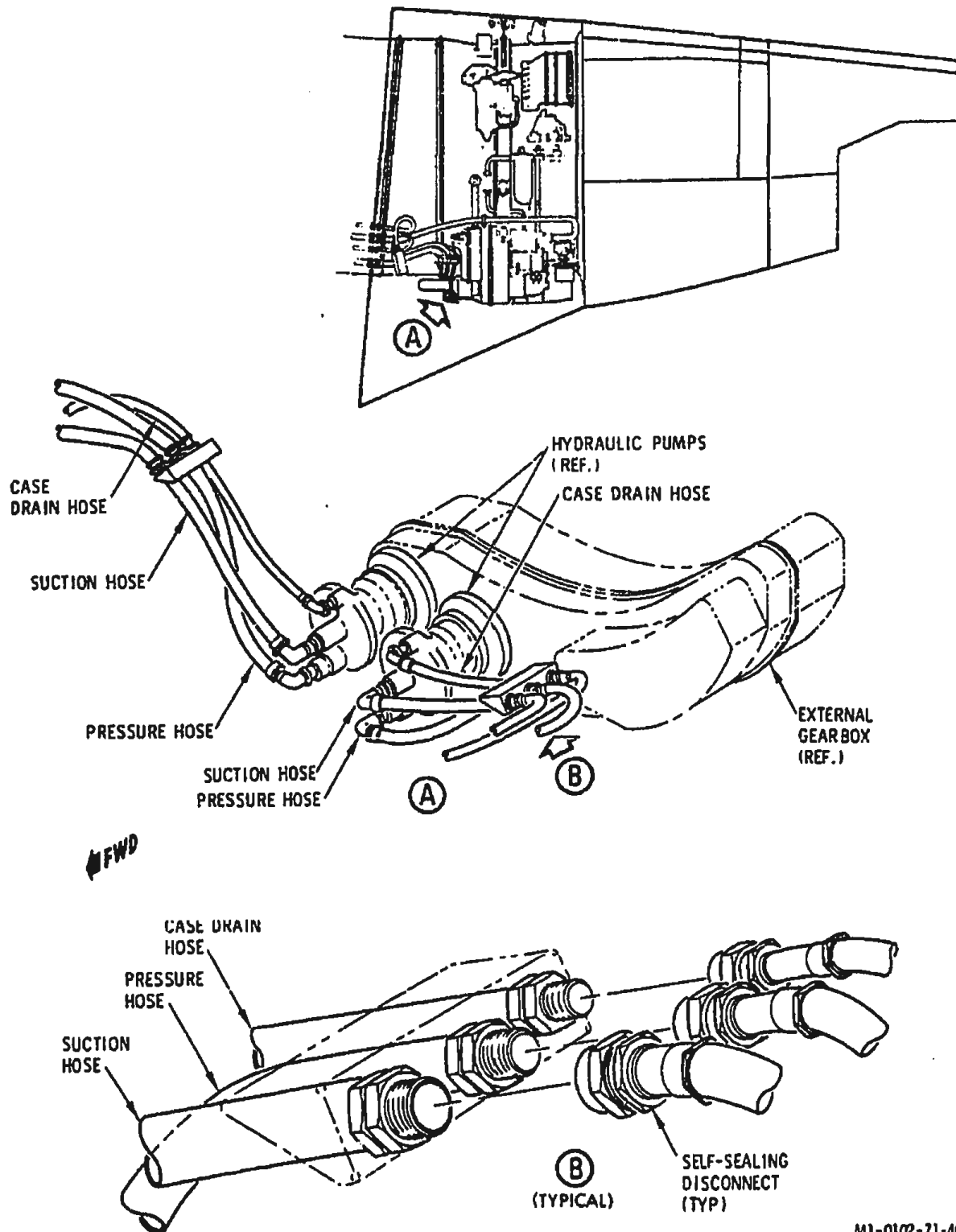
- (1) Verify that circuit breaker opened in Step 4A(2) is open and tagged; verify that tailskid is retracted [Ref. Step 4A(4)]; verify that davit assemblies and portable hoists are in position for installing adapter.

EFFECTIVITY: ALL

0018

71-12-07
Page 403
Aug 15/81

LOCKHEED
MAINTENANCE MANUAL



M1-0102-71-402

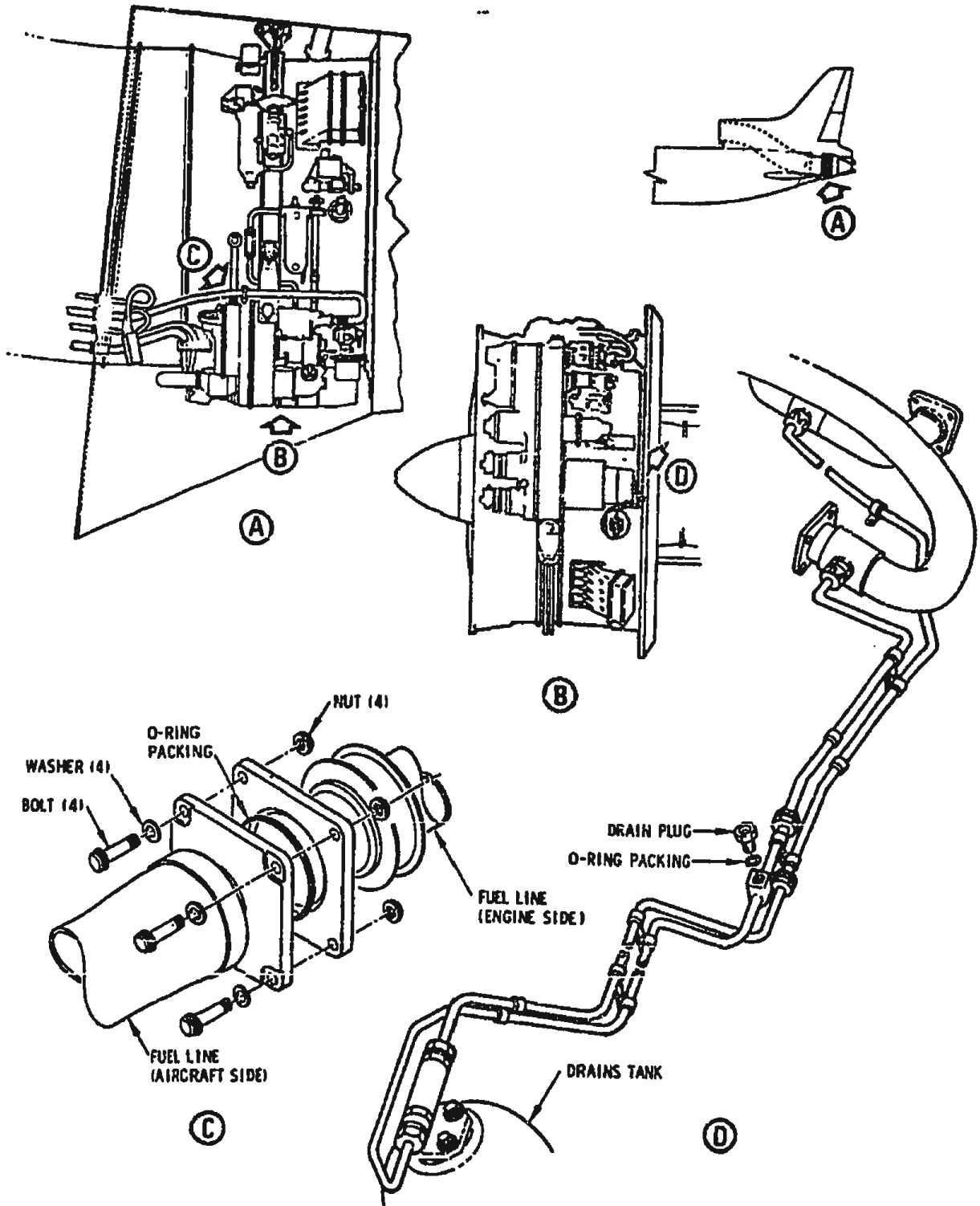
Hydraulic Disconnects
Figure 401

EFFECTIVITY: ALL

71-12-07
Page 404
May 15/77

0016

LOCKHEED
MAINTENANCE MANUAL



M1-0101-71-401

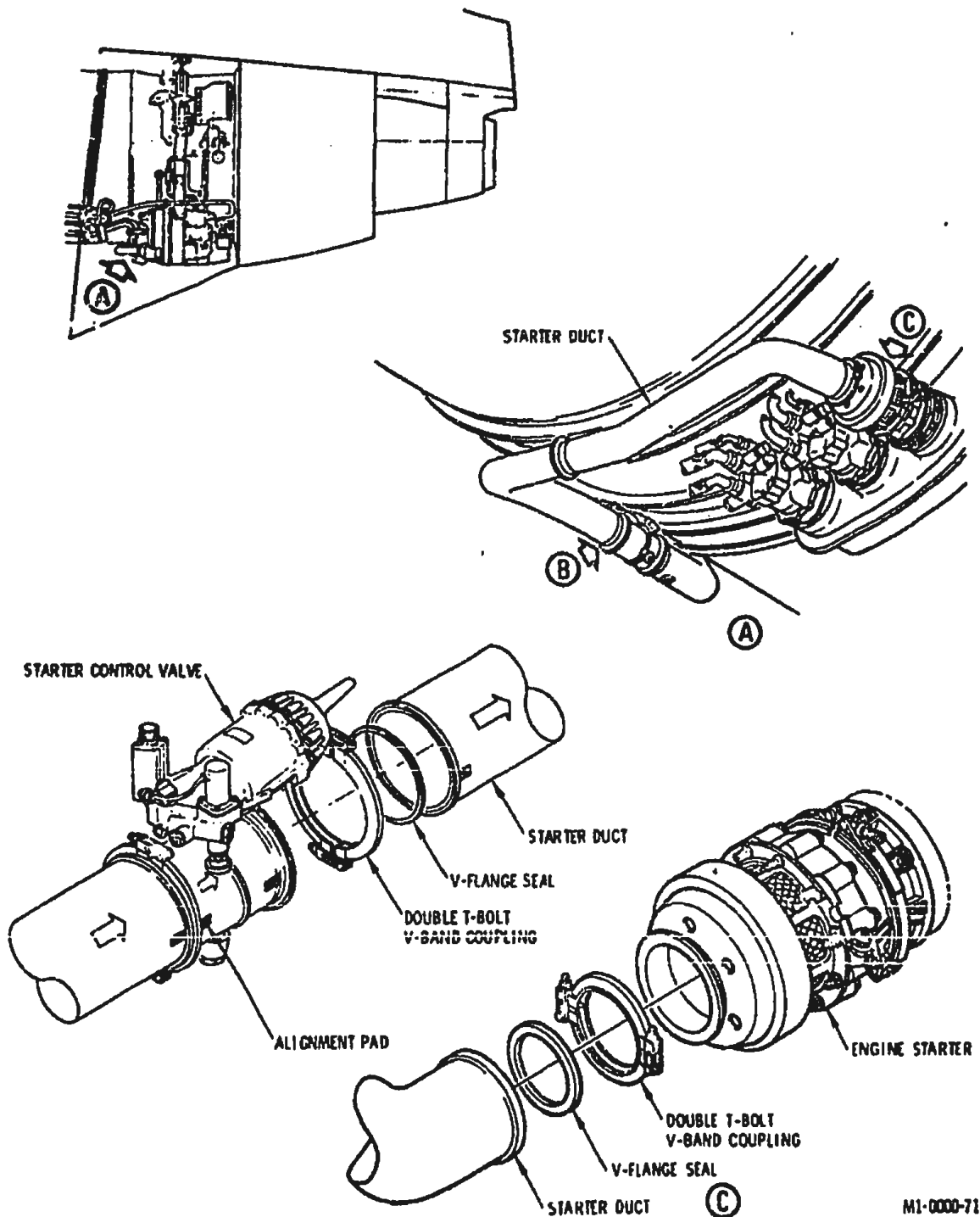
Fuel Line Disconnect
Figure 402

EFFECTIVITY: ALL

001B

71-12-07
Page 405
May 15/77

LOCKHEED
MAINTENANCE MANUAL



M1-0000-71-108

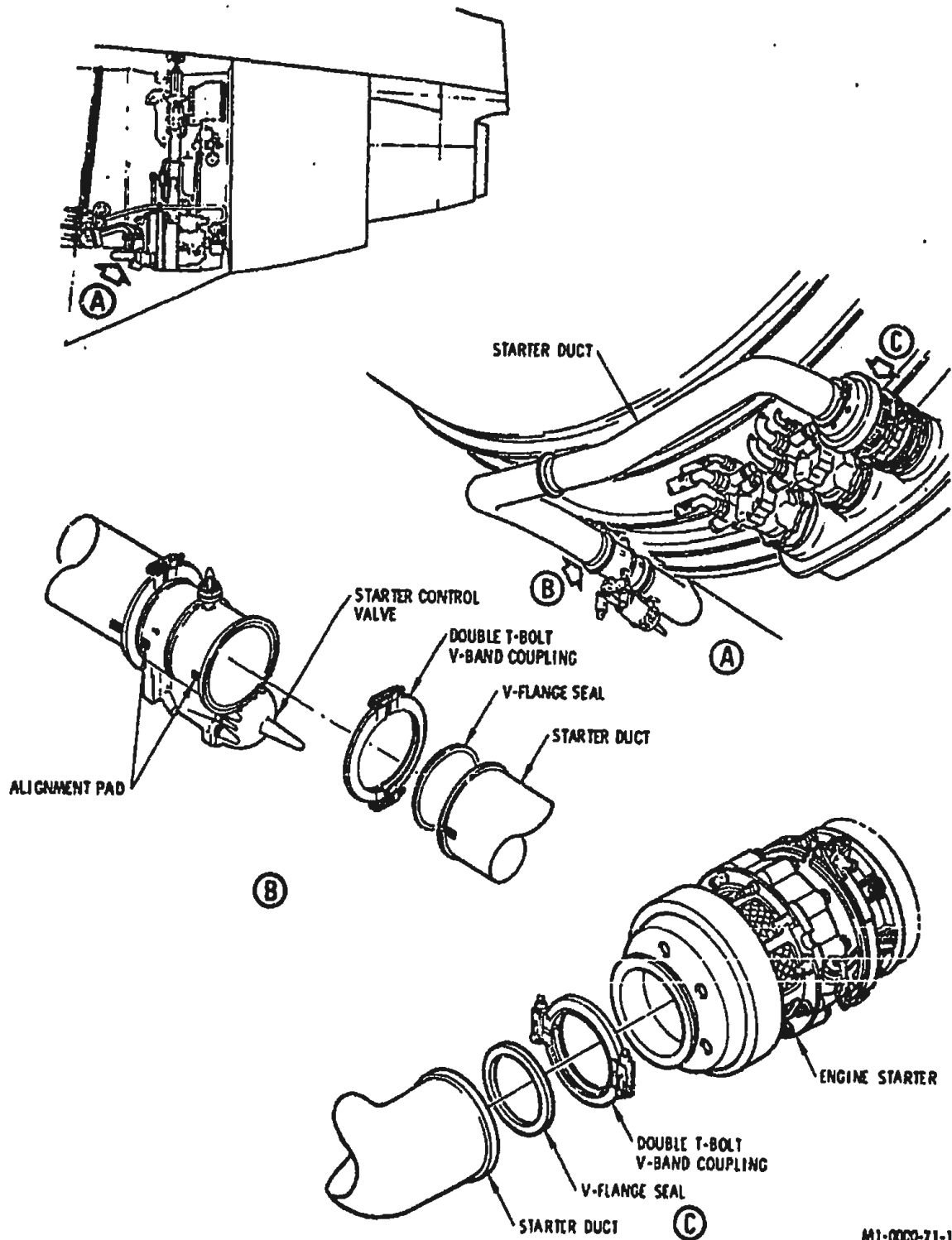
Starter Ducting
Figure 403

R
R
001B

EFFECTIVITY: WITH VALVE ACTUATOR FACING UP

71-12-07
Page 406
Jun 15/94

LOCKHEED
MAINTENANCE MANUAL



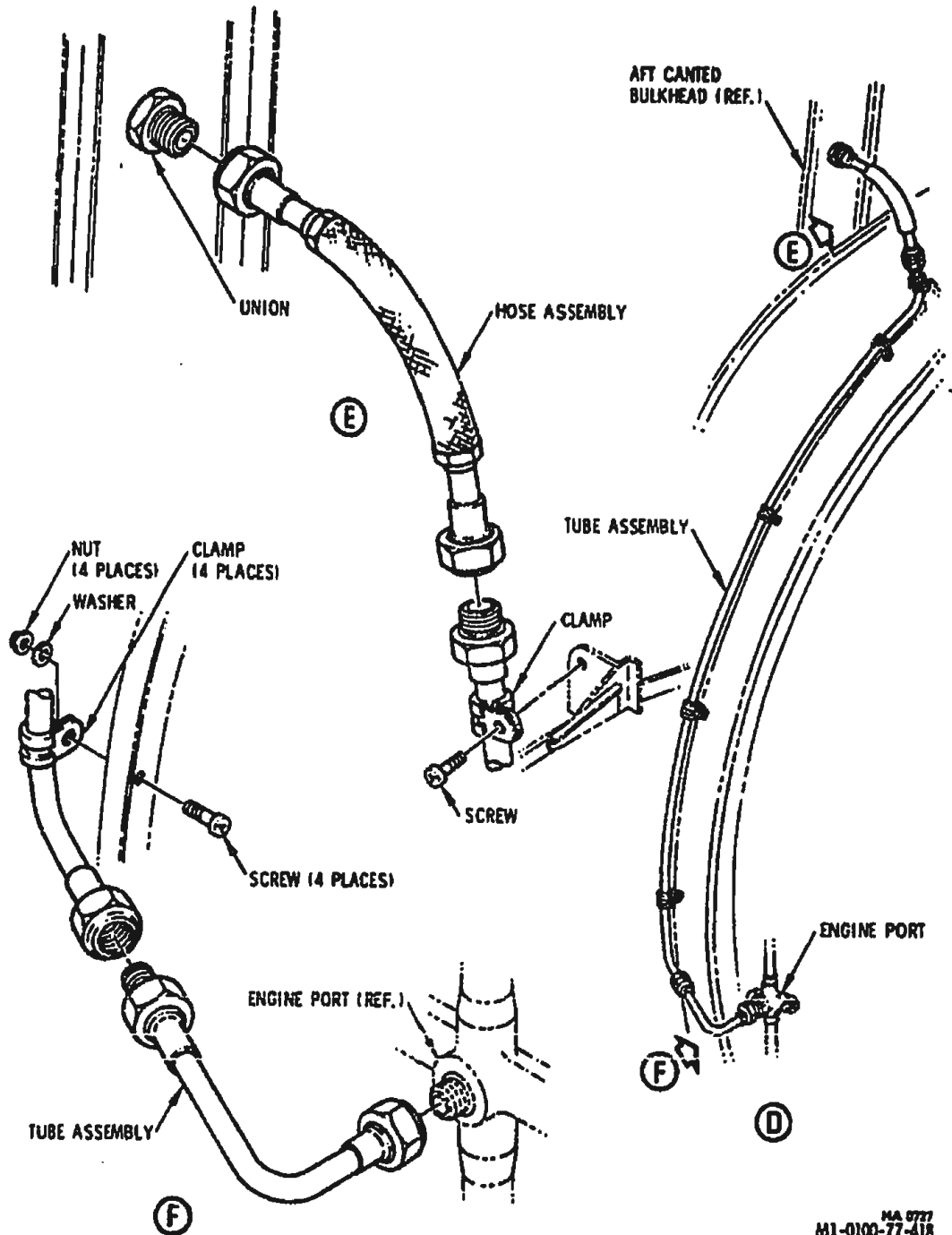
M1-0000-71-104

Starter Ducting
Figure 403

R
R
001B EFFECTIVITY: WITH VALVE ACTUATOR FACING DOWN

71-12-07
Page 407
Jun 15/94

LOCKHEED
MAINTENANCE MANUAL



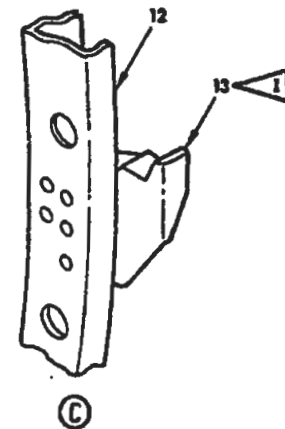
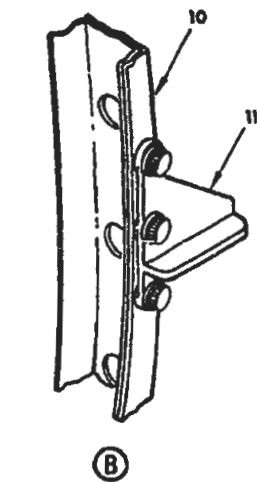
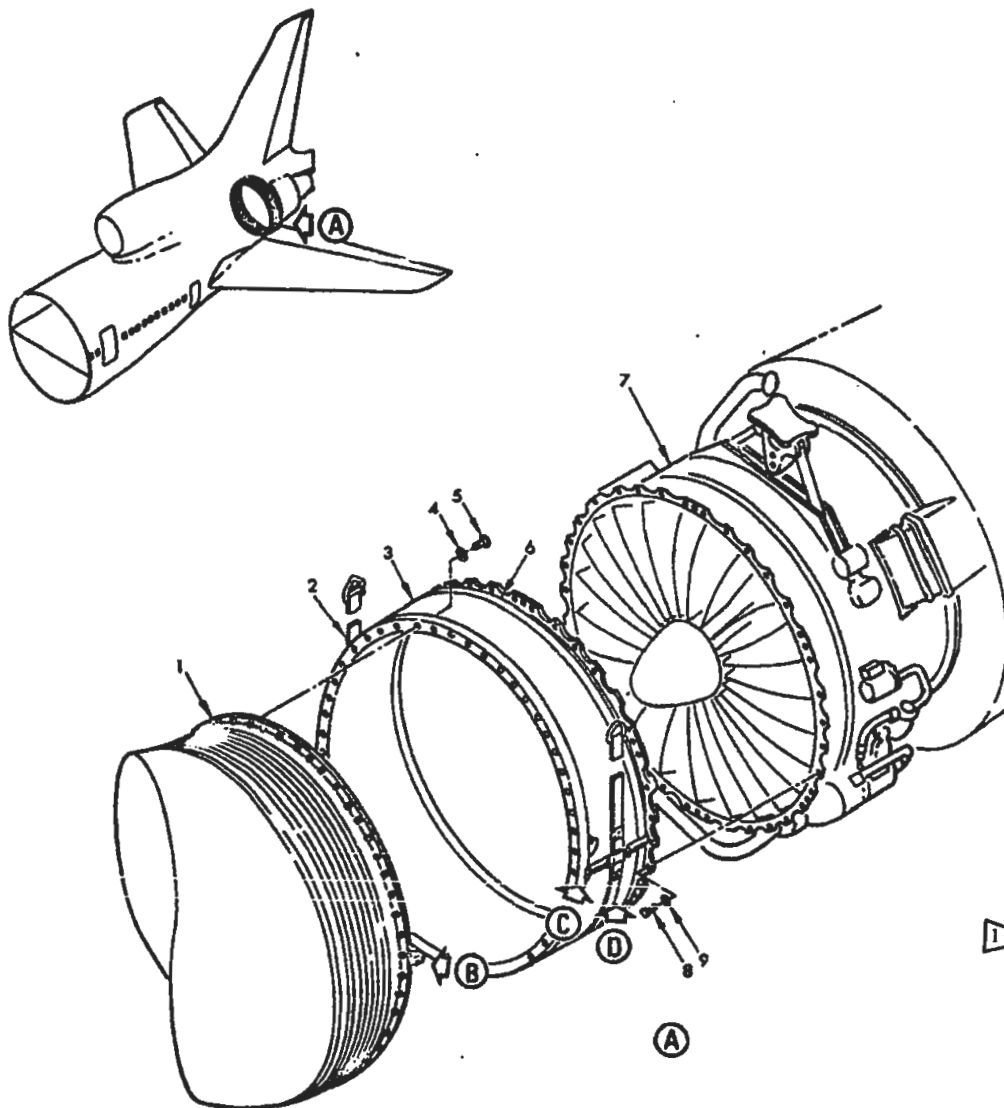
MA 9777
M1-0100-77-418

P1 Probe Tube Assembly
Figure 404

R
R
001B

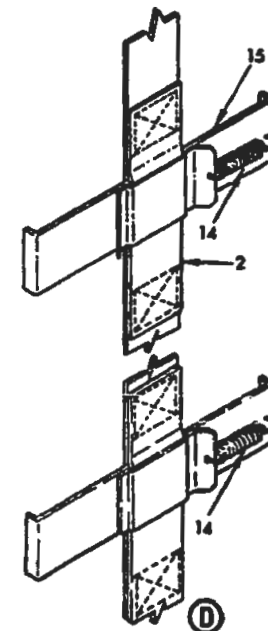
EFFECTIVITY: ALL

71-12-07
Page 408
Jun 15/94



- 1 S-DUCT
- 2 AIR INTAKE ADAPTER SLING
- 3 AIR INTAKE ADAPTER
- 4 WASHER (32)
- 5 BOLT (32)
- 6 SLIP JOINT
- 7 QEC UNIT
- 8 WASHER (36)
- 9 BOLT (36)
- 10 S-DUCT FLANGE
- 11 ALIGNMENT FITTING
- 12 ADAPTER FLANGE
- 13 ALIGNMENT FITTING
- 14 SPRING (4)
- 15 RESTRAINER (2)

NOTE
1 REPLACEMENT OF ADAPTER ALIGNMENT FITTINGS
DURING FIELD OPERATIONS IS NOT REQUIRED



MI-0000-71-095

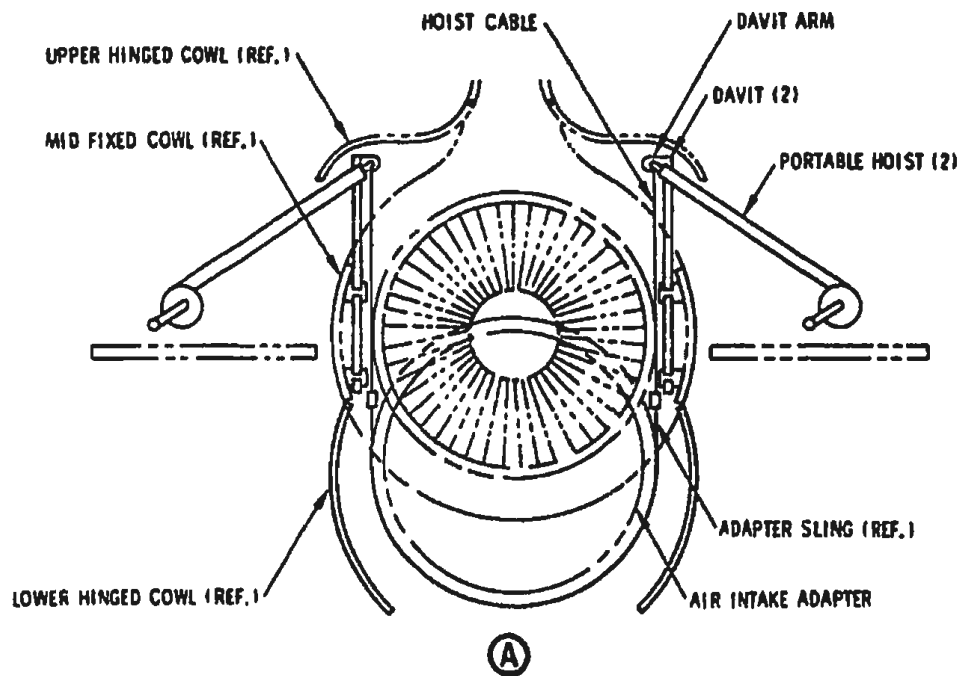
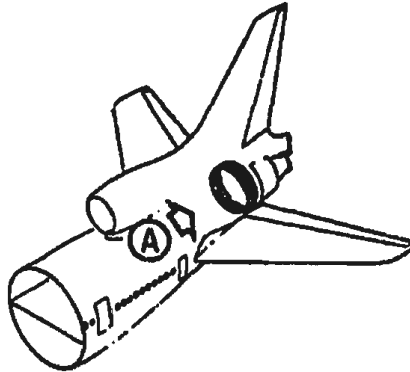
Air Intake Adapter - Removal and Installation
Figure 405

C
C
R
R
001B

EFFECTIVITY: ALL

71-12-07
Page 409/410
Jun 15/94

LOCKHEED
MAINTENANCE MANUAL



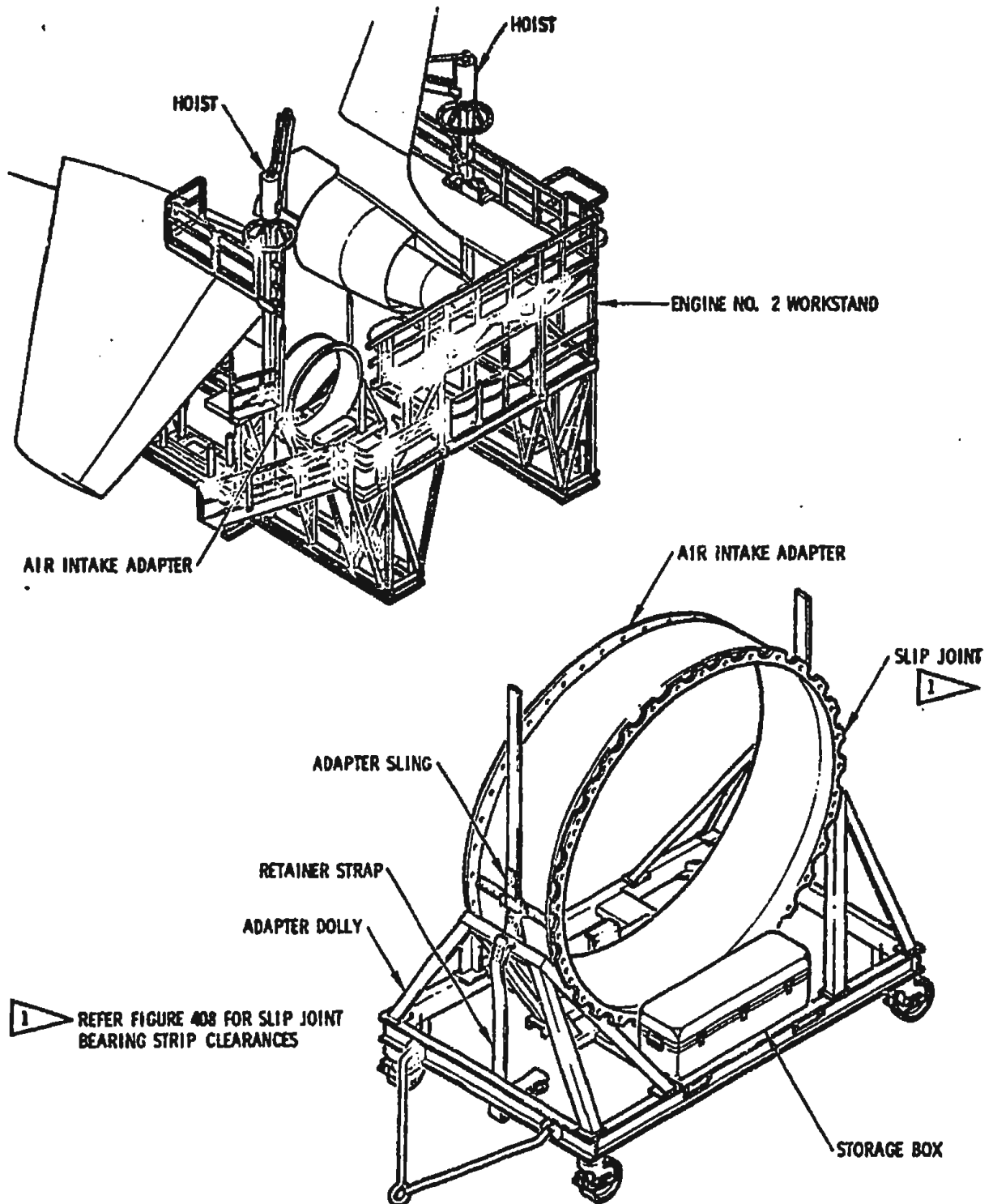
M1-0100-71-459

Adapter Removal Equipment
Figure 406

R EFFECTIVITY: ALL
R
001B

71-12-07
Page 411
Jun 15/94

LOCKHEED
MAINTENANCE MANUAL



M1-0000-71-080

Air Intake Adapter Dolly
Figure 407

C
C
R
R
001B

EFFECTIVITY: ALL

71-12-07
Page 412
Jun 15/94



MAINTENANCE MANUAL

- (2) Inspect air intake adapter bearing for clearance (Ref. 71-12-07, Inspection and Check).
- (3) Place air intake adapter in position for installation below No. 2 engine.
- (4) Compress adapter slip joint and attach sling to adapter (Ref. Fig. 405).
- (5) Attach hoist cables to adapter sling end fittings.
- (6) Actuate hoist to take up slack in cables and release adapter from dolly.
- (7) Raise the adapter carefully, guiding it between S-duct and engine low-pressure compressor case.
- (8) Verify that alignment fittings on adapter mate with alignment fittings on S-duct as adapter is raised into position (Ref. Fig. 405).
- (9) Install bolts to attach adapter to S-duct.
- (10) Align adapter with engine low-pressure compressor case and install attachment bolts and washers.

NOTE: The aft end of the S-duct is not rigidly attached to the aircraft structure. It may be necessary to raise the adapter and S-duct slightly to mate to the engine.

NOTE: If a new air intake adapter is installed or if the seal joint has been disassembled, refer to Paragraph 3C before continuing to Step 3B(11).

- (11) Disconnect the sling from the adapter, lower it to ground level, and disconnect hoist cables.
- (12) Store the sling in the dolly storage compartment.
- (13) Wind up hoist cables. Remove portable hoists from davits then remove davits from mid fixed cowls.
- (14) Tighten fire detector loop clamps.
- (15) Connect P1 probe tube assembly and connect clamps to adapter (Ref. Fig. 404).
- (16) Connect proximity switches and wire harness to adapter access door.

R
R
001B

EFFECTIVITY: ALL

71-12-07
Page 413
Jun 15/94



- (17) Install LP compressor spinner and anti-icing tube (Ref. 72-31-03)
- (18) Install starter duct section (Ref. Fig. 403) with double T-bolt V-band couplings (Ref. 20-36-02).
- (19) Remove fuel line protective caps and connect fuel line (Ref. Fig. 402).
- (20) Remove protective caps from B1 and C1 pump hydraulic lines and connect hydraulic lines (Ref. Fig. 401).
- (21) Close LH and RH upper hinged cowl (Ref. 71-12-05).
- (22) Close LH and RH lower hinged cowl (Ref. 71-12-01).
- (23) Turn on electrical power (Ref. 24-41-00) and hydraulic system A power (Ref. 29-11-00).
- (24) Open panel 318BA, and place the tailskid ground service switch to EXTEND position. Verify that tailskid extends.
- (25) Close panel ensuring that warning flag is folded in position and not visible.
- (26) Turn off electrical power (Ref. 24-41-00) and hydraulic system A power (Ref. 29-11-00). (27) Remove tag and close circuit breaker opened in Step 4A(2).
- (28) Remove air intake adapter dolly and workstand from work area.

C. Air Intake Adapter Bearing Strip Clearance Check

- (1) Remove 1541441 Retainers by removing 30 NAS51034 Bolts and pull back 1540234 Seal from upper half of 1559747 Cone. Tag and remove 1540235 Bearing Strips at three upper locations.
- (2) Measure the gap between the cone and the adapter skin at approximately the 3 and 9 o'clock positions. See Figure 408, View B for details.

NOTE: Total gap for the 3 and 9 o'clock positions, sum of both left and right sides, minus the total thickness of both bearing strips is the clearance. The total horizontal clearance, 3 and 9 o'clock positions, shall be 0 to 0.050 inch with zero clearance preferred.

R EFFECTIVITY: ALL

71-12-07
Page 414
Jun 15/94

001B



MAINTENANCE MANUAL

- (3) With correct bearing strips installed in two upper side positions, repeat gap measurement, similar to Step 2 at approximately the 12 o'clock position and the upper ends of the installed side bearing strips. Subtract bearing strip thickness from gap measurement.

NOTE: Resultant measurement is the clearance between the bearing strip and the adapter skin. It shall not exceed 0.050 inch. The minimum clearance shall be 0.005 inch and is the preferred clearance.

- (4) If maximum clearance exceeds 0.050, remove the lower bearing strips and install 1540235-101 (0.280 thickness) Bearing Strips locating bottom bearing strip symmetrically about vertical centerline. Repeat Steps 2 and 3, if strips are already 0.280 and excessive clearance exists, contact MCI Engineering for additional shimming instructions.

- (5) Use 1540235-101 (.280 thick) Bearing Strip to attain clearance requirements stated in notes following Steps 2 and 3.

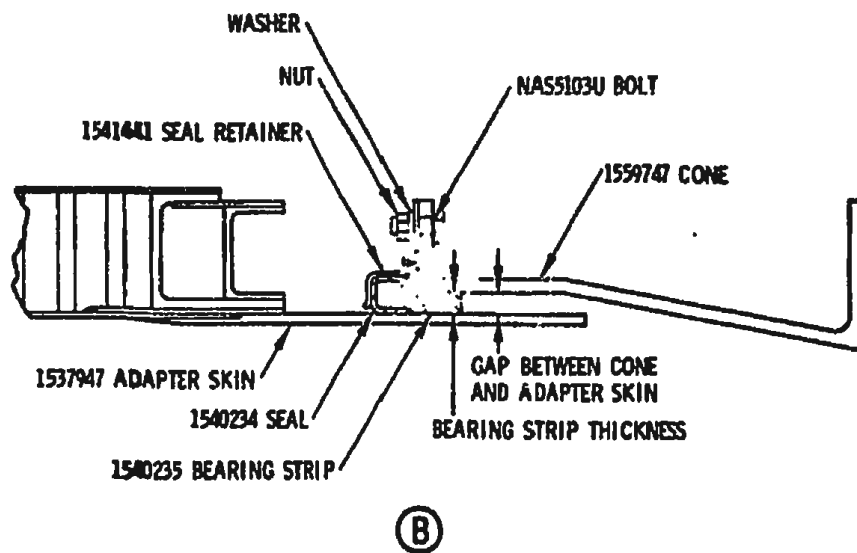
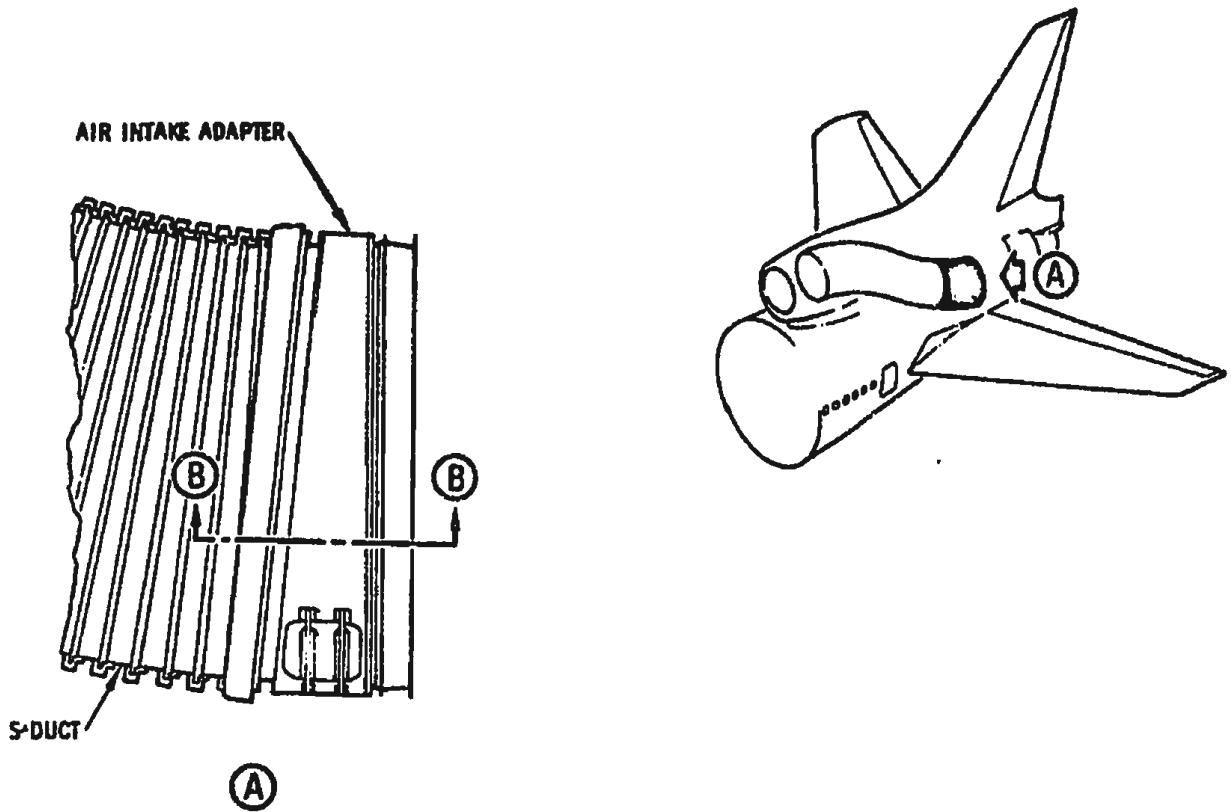
- (6) Install 1540234 Seal and 1541441 Retainer using NAS 5103U Bolts, AN 960C10L Washers and LH 7559-3 Nuts.

R EFFECTIVITY: ALL

001B

71-12-07
Page 415
Jun 15/94

LOCKHEED
MAINTENANCE MANUAL



M1-0000-71-081

Air Intake Adapter Bearing Strip
Clearance Check
Figure 403

C
C
C

R
R
001B

EFFECTIVITY: ALL

71-12-07
Page 416
Jun 15/94

AIR INTAKE ADAPTER - INSPECTION AND CHECK1. Referenced Procedures

- 20-51-08 Touchup Requirements For Finishes On L1011 Aircraft
- PB 78-463C
- 71-12-01 LH and RH Lower Hinged Cowls - Servicing
- 71-12-05 LH and RH Upper Hinged Cowls - Servicing

2. Inspection/Check

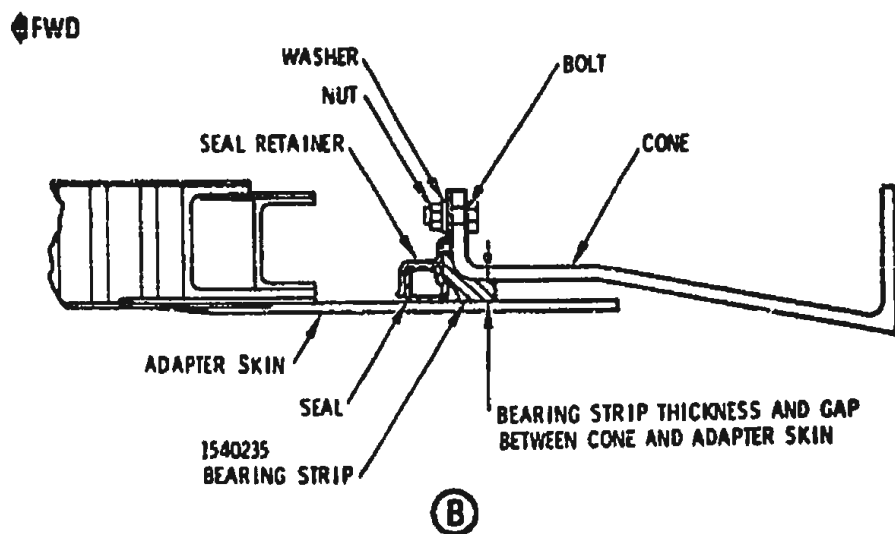
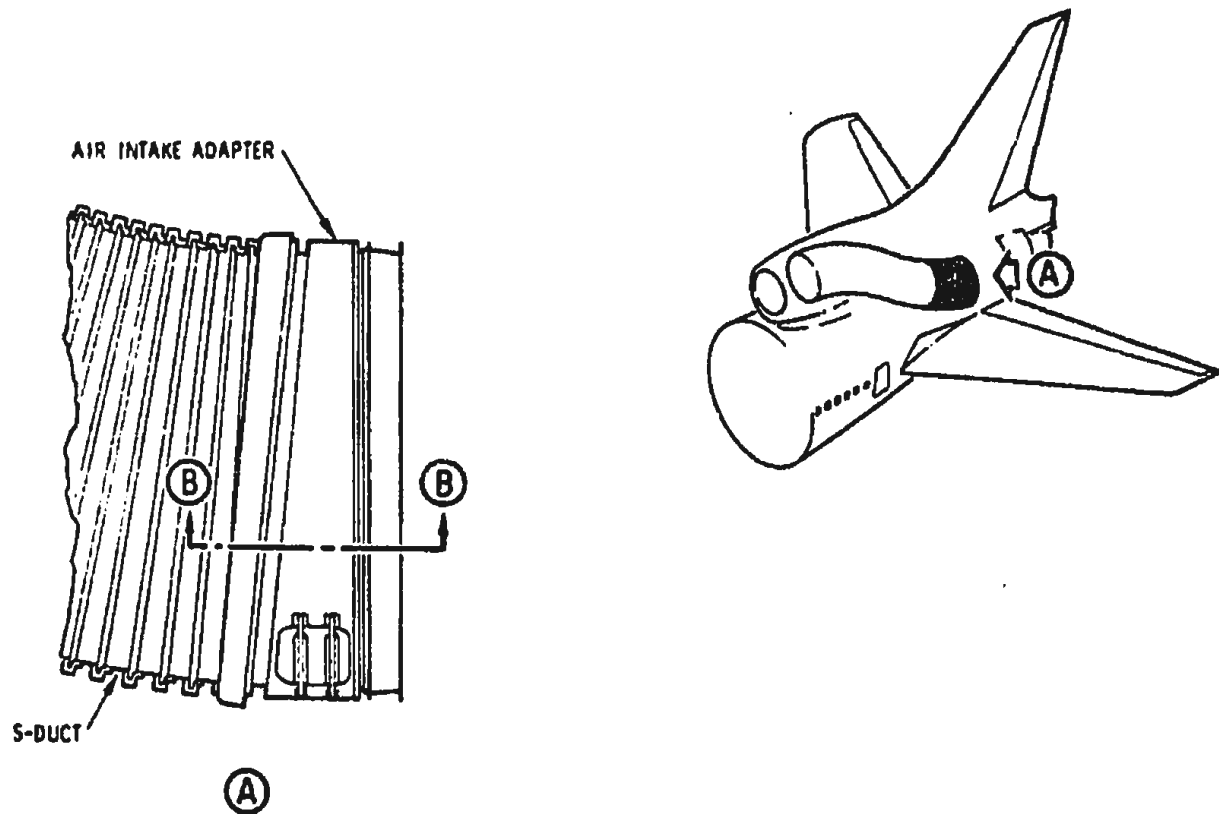
A. Air Intake Adapter Bearing Strip Clearance

- (1) On pilots center control pedestal, zone 210, place warning tag on engine power control levers with placard indicating maintenance activity at No. 2 engine.
- (2) Open LH and RH upper hinged cowls (Ref. 71-12-05).
- (3) Open LH and RH lower hinged cowls (Ref. 71-12-01).
- (4) Remove nuts, washers, and bolts attaching the three upper retainers to the cone and remove retainers (Ref. Fig. 601).
- (5) Pull seal forward, away from upper half of the cone.
- (6) Remove the three upper bearing strips.
- (7) Measure gap between cone and adapter skin at approximately the 3 and 9 o'clock positions. Determine bearing strip thickness to attain minimum clearance between bearing strip and adapter skin.

NOTE: Total gap at the 3 and 9 o'clock positions (sum of both left and right sides) minus total thickness of both bearing strips is the clearance. The total horizontal clearance (3 and 9 o'clock positions) must be 0 to 0.050 inch with zero clearance preferred.

- (8) On aircraft 001-031 without SB54-031, install bearing strips 1540235-101 (0.280 thickness) or 1540235-103 (0.240 thickness) in two upper side positions. If possible, use thicker bearing strip to provide preferred minimum clearance condition.

LOCKHEED
MAINTENANCE MANUAL



M1-0002-71-601

R
R

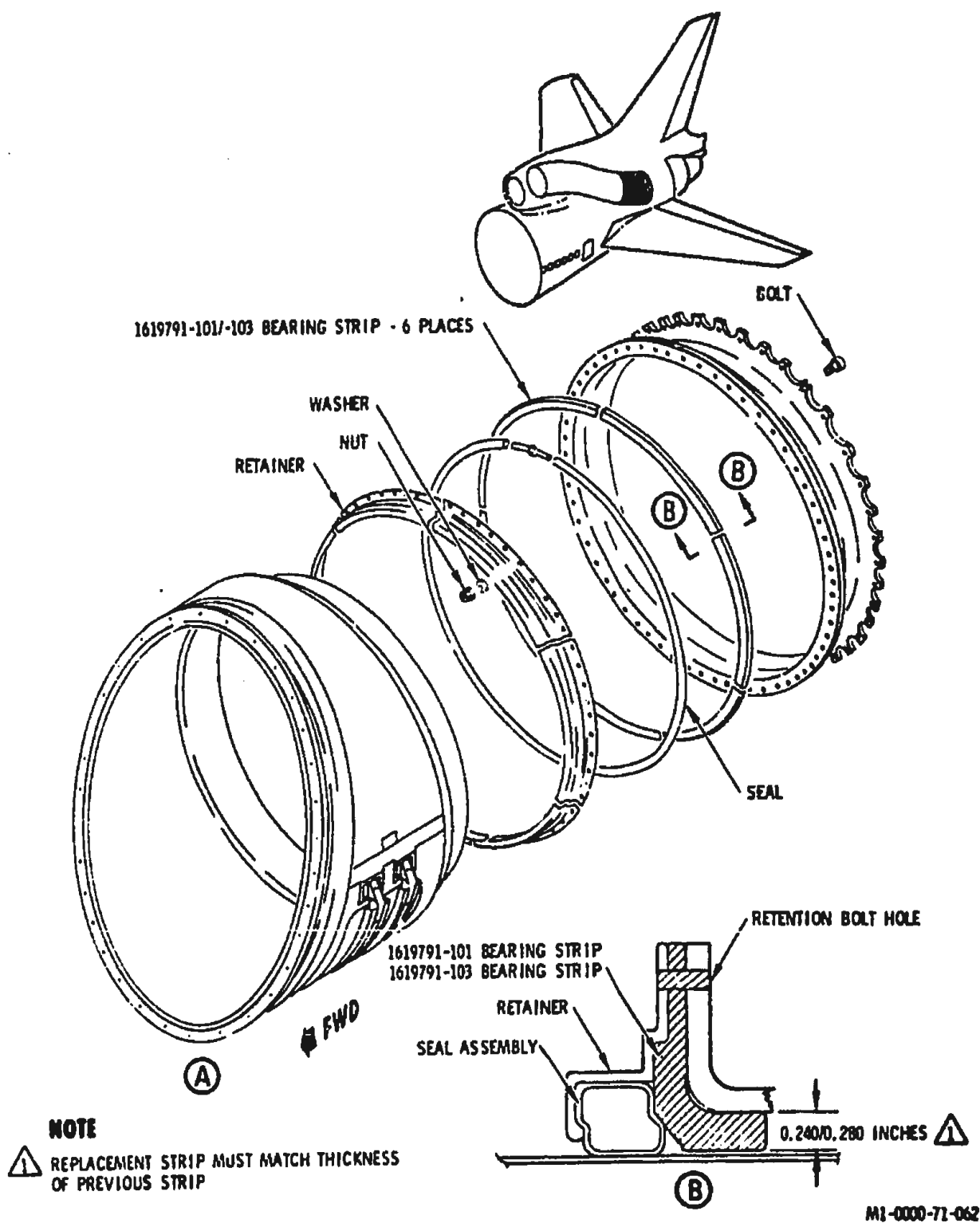
Air Intake Adapter Seal
Figure 601

EFFECTIVITY: 001-031 WITHOUT SB54-031

001F

71-12-07
Page 602
Dec 15/80

LOCKHEED
MAINTENANCE MANUAL



M1-0000-71-062

Air Intake Adapter Seal
Figure 601

R
R
R
001E

EFFECTIVITY: 001-031 WITH SB54-031 AND 032-999

71-12-07
Page 603
Dec 15/80



- (8) On aircraft 001-031 with SB54-031 and 032-999, install bearing strips 1619791-101 (0.280 thickness) or 1619791-103 (0.240 thickness) in two upper side positions. If possible, use thicker bearing strip to provide preferred minimum clearance condition.
- (9) On aircraft 001-031 without SB54-031, measure gap between cone and adapter skin at approximately the 12 o'clock position and at upper ends of the installed side bearing strips. Subtract bearing strip thickness from gap measurement.

NOTE: Resultant measurement is the clearance between the bearing strip and the adapter skin. It must not exceed a maximum of 0.050 inch. Minimum (preferred) clearance is 0.005 inch.

- (10) On aircraft 001-031 without SB54-031, if maximum clearance exceeds 0.050 inch, install 0.280-inch thick bearing strips in the lower center position; repeat Steps (6), (7), (8), and (9).
- R (11) Install upper bearing strip (0.280 or 0.240 thickness) to attain clearance required. If possible, use thicker bearing strip to provide preferred minimum clearance condition.
- (12) Place the seal in correct position and install all retainers with bolts, washers and nuts.
- (13) Close upper and lower hinged cowl.
- (14) Remove warning tag from engine power control lever.

B. Air Intake Adapter Paint

Intumescent paint on the air intake adapter is not required. Peeled areas with bare aluminum must be painted with ER primer LCM 37-1035 or equivalent (Ref. 20-51-08 for application of primer).

MOUNTS - DESCRIPTION AND OPERATION1. General

The propulsion system is suspended on mounts which attach to the pylon structure for engines No. 1 and 3, and the center engine support structure for engine No. 2. Each engine has two mounts which are positioned in tandem. The engine front mount (Ref. Fig. 1) is secured to the top of the low pressure (LP) compressor case and transmits engine thrust, vertical loads and side loads to the aircraft structure. The engine rear mount (Ref. Fig. 2) is secured to the top of the LP turbine bearing and support assembly and transmits torsional, vertical and side loads to the aircraft structure. Spherical bearings incorporated in the mounts allow for thermal expansion and misalignment. Fail-safe features are incorporated in both mounts.

The mounts for engines No. 1 and 3 are secured directly to the pylon structure.

R Engine No. 2 mounts are identical to those on engines No. 1 and 3, but the method of attachment to the aircraft structure is different.

R On aircraft 001-014,
R the engine front mount (Ref. Fig. 3, Sheet 1) is secured to a
R spider which is part of the center engine support structure.

R On aircraft 015-999,
R the engine front mount (Ref. Fig. 3, Sheet 2) is secured
R directly to aircraft structure with four mount bolts and a
R dowel.

R On aircraft 001-014,
R the engine rear mount (Ref. Fig. 4, Sheet 1) is secured with
R four mount bolts which pass through spools in the center engine
R support structure.

R On aircraft 015-999,
R the engine rear mount (Ref. Fig. 4, Sheet 2) is secured to a
CESS rear mount box, which is part of the structure, with four
mount bolts and a dowel.

2. Front Engine MountA. Description and Operation

EFFECTIVITY: ALL

001B

71-20-00
Page 1
Jun 15/93



MAINTENANCE MANUAL

The engine front mount is located at the top center position of the LP compressor case, zones 410, 420 and 430.

The front mount (Ref. Fig. 1) comprises two support links, an outer support, a center thrust link and a spherical bearing housing. The support links are connected by hollow pins and spherical bearings to lugs on the LP compressor case and the underside of the outer support. The center thrust link is connected at its upper end, by hollow pins and spherical bearings, to transversely and axially positioned lugs on the underside of the outer support. The lower end of the thrust link is located in the spherical bearing housing, which is secured to the LP compressor case at the top center position.

To provide a fail-safe feature in the mount, a pin is freeze fitted transversely through the lower section of the center thrust link and extends into two lugs integral with the spherical bearing housing; the pin is retained by two stop brackets. Adequate clearance is left between the pin and the lugs such that no load is carried by the pin unless failure of a support link occurs.

The outer support is located by a shear pin and secured by four bolts, directly to the pylon structure for wing-mounted propulsion systems and to the spider of the center engine support structure for the fuselage-mounted propulsion system.

Engine thrust is transmitted through the spherical bearing housing, center thrust link and outer support to the pylon or center engine support structures. The transversely and axially positioned spherical bearing assemblies allow the center thrust link to pivot, ensuring that torque is not transmitted to the aircraft structure. The support links transmit vertical and side loads through the outer support to the aircraft structure.

3. Rear Engine Mount

A. Description and Operation

The engine rear mount is located at the top center position of the LP turbine bearing and support assembly, zones 410, 420 and 430.

The rear mount (Ref. Fig. 2) comprises a support bracket, two left-hand links, two center links, two stabilizing plates and left-hand and right-hand hoop plate seals. The links are connected to the support bracket and LP turbine bearing and support assembly by hollow pins and spherical

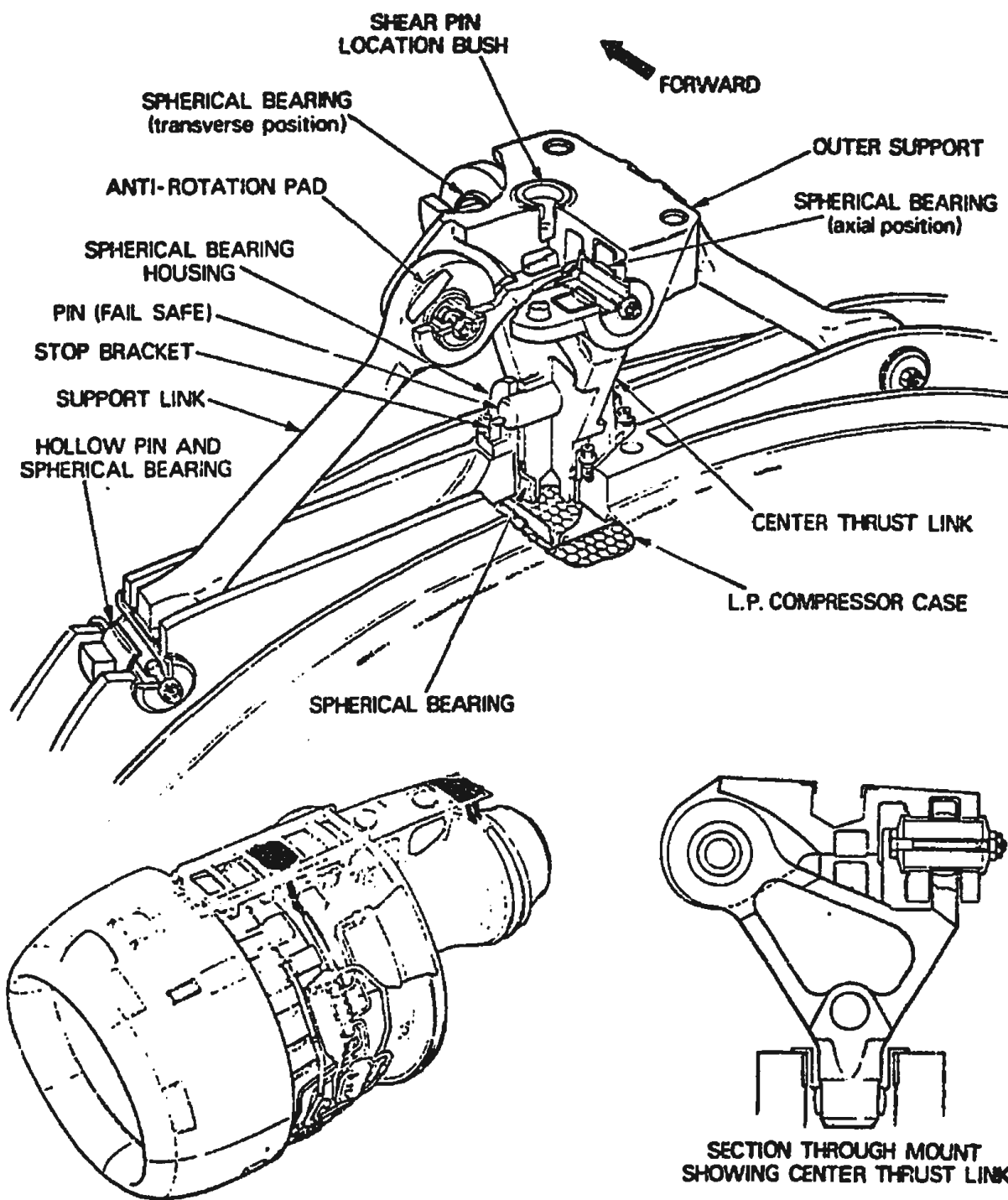
R EFFECTIVITY: ALL

001B

71-20-00

Page 2
Jun 15/93

LOCKHEED
MAINTENANCE MANUAL



M1-0101-71-010

Engine Front Mount
Figure 1

EFFECTIVITY: ALL

001B

71-20-00
Page 3
May 15/77



MAINTENANCE MANUAL

bearings. The stabilizing plates are secured, one either side, to the support bracket and lugs on the plates bear on the upper eye-ends of the links.

Two pairs of locating lugs at the rear of the support bracket provide for attachment of the hoop plate support links (Ref. 72-03-00). A left-hand and right-hand hoop plate seal assembly, secured to the underside of the support bracket, mates with the rear hoop plate assembly to provide a fireproof seal around the rear mount.

Close clearance snubber bosses, integral with the support bracket, around the periphery of each link upper eye-end form a fail-safe device. If a link failure should occur, movement of the hollow pin and spherical bearing assembly in the support bracket is restricted by the eye-end of the failed link bearing against the snubber boss. This will hold the pin in a near horizontal attitude and ensure the other link bears the load.

The stabilizing plates ensure stability of the link arrangement by limiting possible movement of the hollow pins in the support bracket and also by preventing individual links rotating about their own axis.

The support bracket is located by a shear pin and secured by four bolts, directly to the pylon structure on wing-mounted propulsion systems and to the box structure of the center engine support structure for fuselage-mounted propulsion systems.

The rear mount transmits vertical and side loads to the aircraft structure through the left-hand and right-hand links, and the support bracket. The center links are positioned tangentially to transfer engine torsional loads through the support bracket to the aircraft structure.

4. Engine No. 2 Mount Spiders and Adapters (Aircraft 001-014)

A. Description and Operation

The forged titanium front mount spider is a high-strength adapter that bolts directly to the engine front mount and with a shim to the center engine support structure assembly. The extremities of the four legs are drilled for attachment to bolts located in the corners of the structure assembly box. The spider provides the forward mount with more effective dispersal of the engine forward thrust to the pylon floor. A sheet brass antifretting separator is bonded to the spider at the front mount mating surface. Four rear mount titanium spools and brass shims are located in the

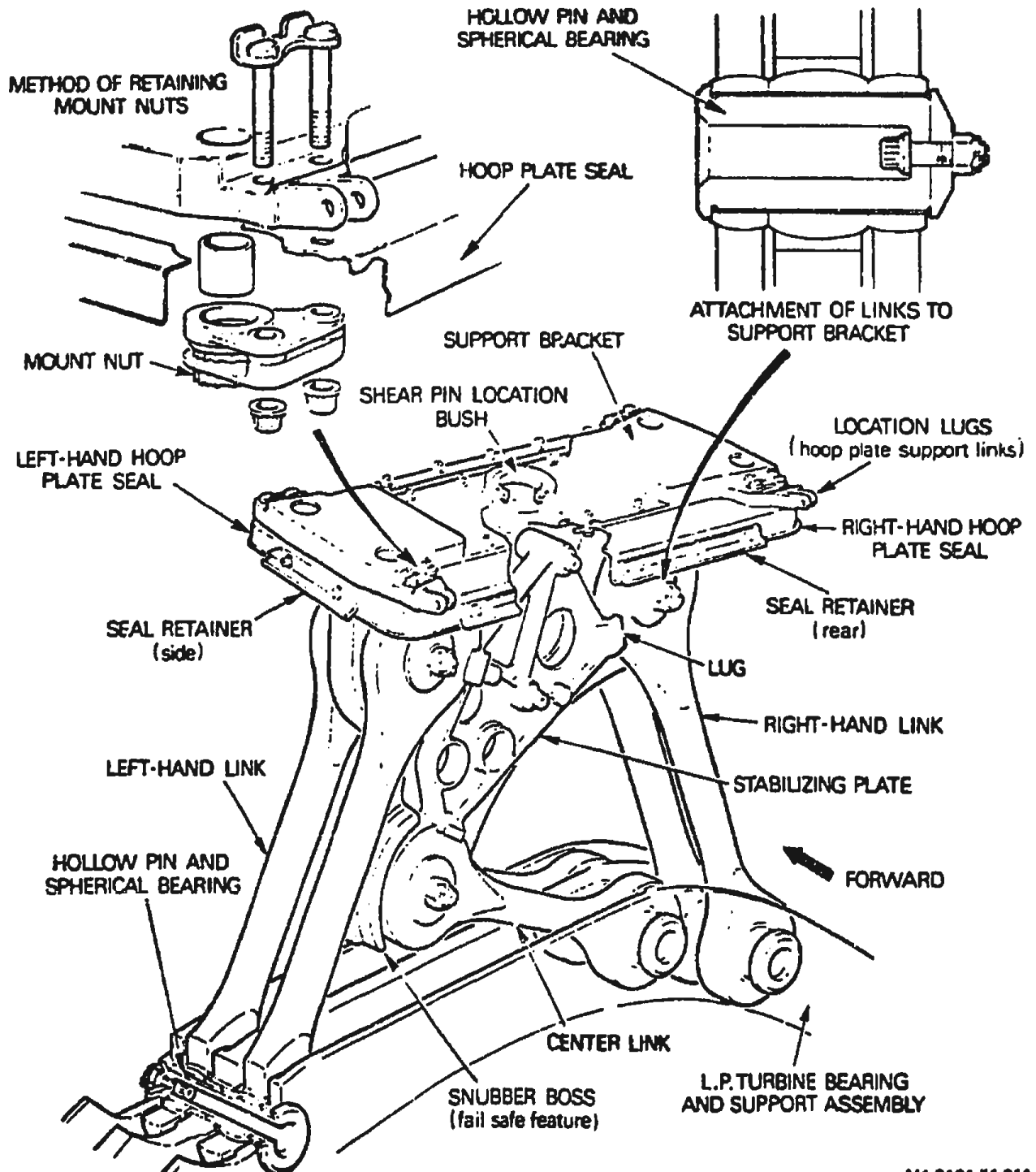
R EFFECTIVITY: ALL

R
001B

71-20-00

Page 4
Jun 15/93

LOCKHEED
MAINTENANCE MANUAL



M1-0101-71-011
30161

Engine Rear Mount
Figure 2

EFFECTIVITY: ALL

001B

71-20-00
Page 5
May 15/77

LOCKHEED



MAINTENANCE MANUAL

rear mount support structure box. These replaceable adapters position the engine mounting bolts and carry their loadings.

R EFFECTIVITY: ALL

R

001B

71-20-00

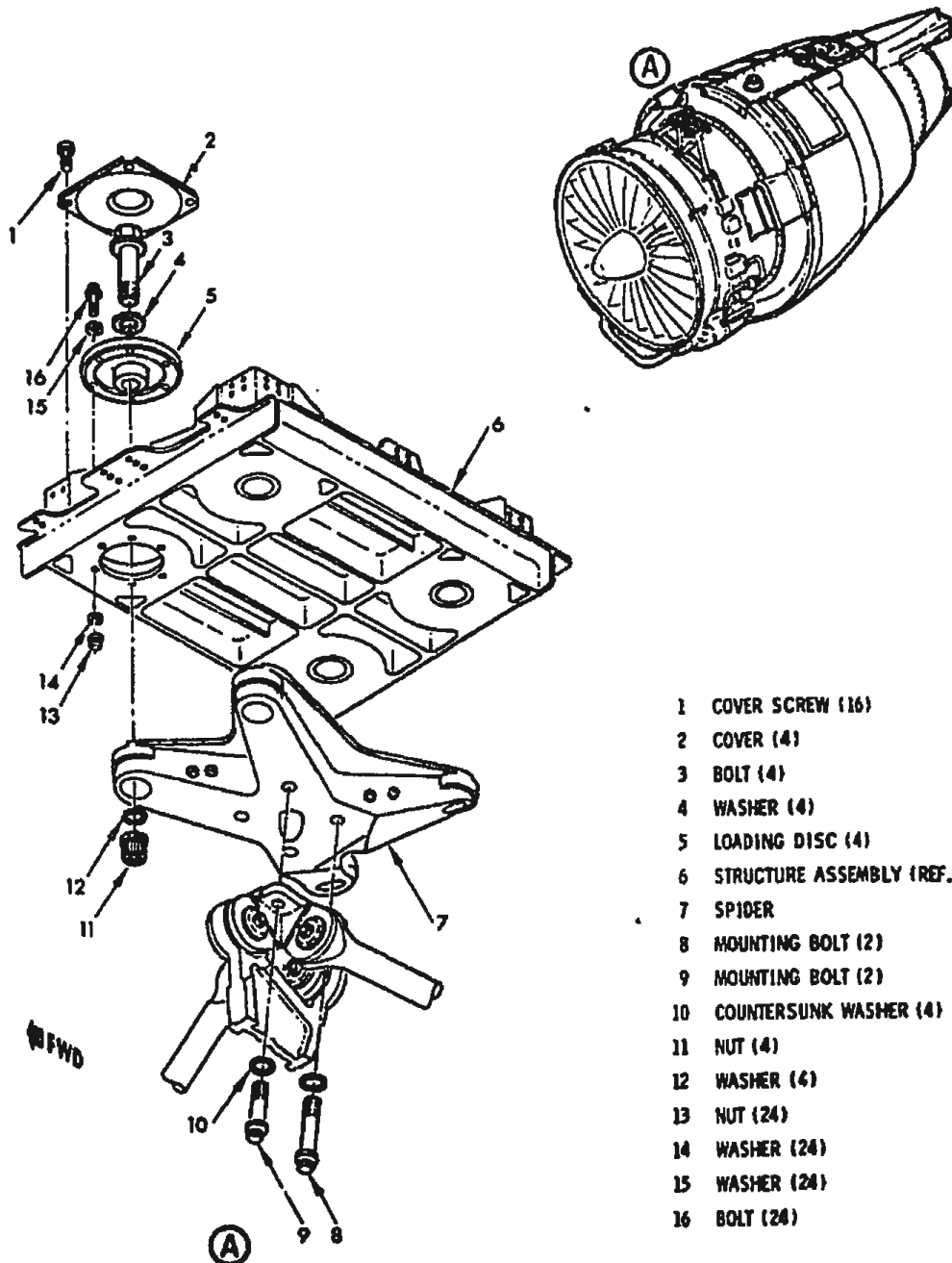
Page 6

Jun 15/93

LOCKHEED



MAINTENANCE MANUAL



- 1 COVER SCREW (16)
- 2 COVER (4)
- 3 BOLT (4)
- 4 WASHER (4)
- 5 LOADING DISC (4)
- 6 STRUCTURE ASSEMBLY (REF.)
- 7 SPIDER
- 8 MOUNTING BOLT (2)
- 9 MOUNTING BOLT (2)
- 10 COUNTERSUNK WASHER (4)
- 11 NUT (4)
- 12 WASHER (4)
- 13 NUT (24)
- 14 WASHER (24)
- 15 WASHER (24)
- 16 BOLT (24)

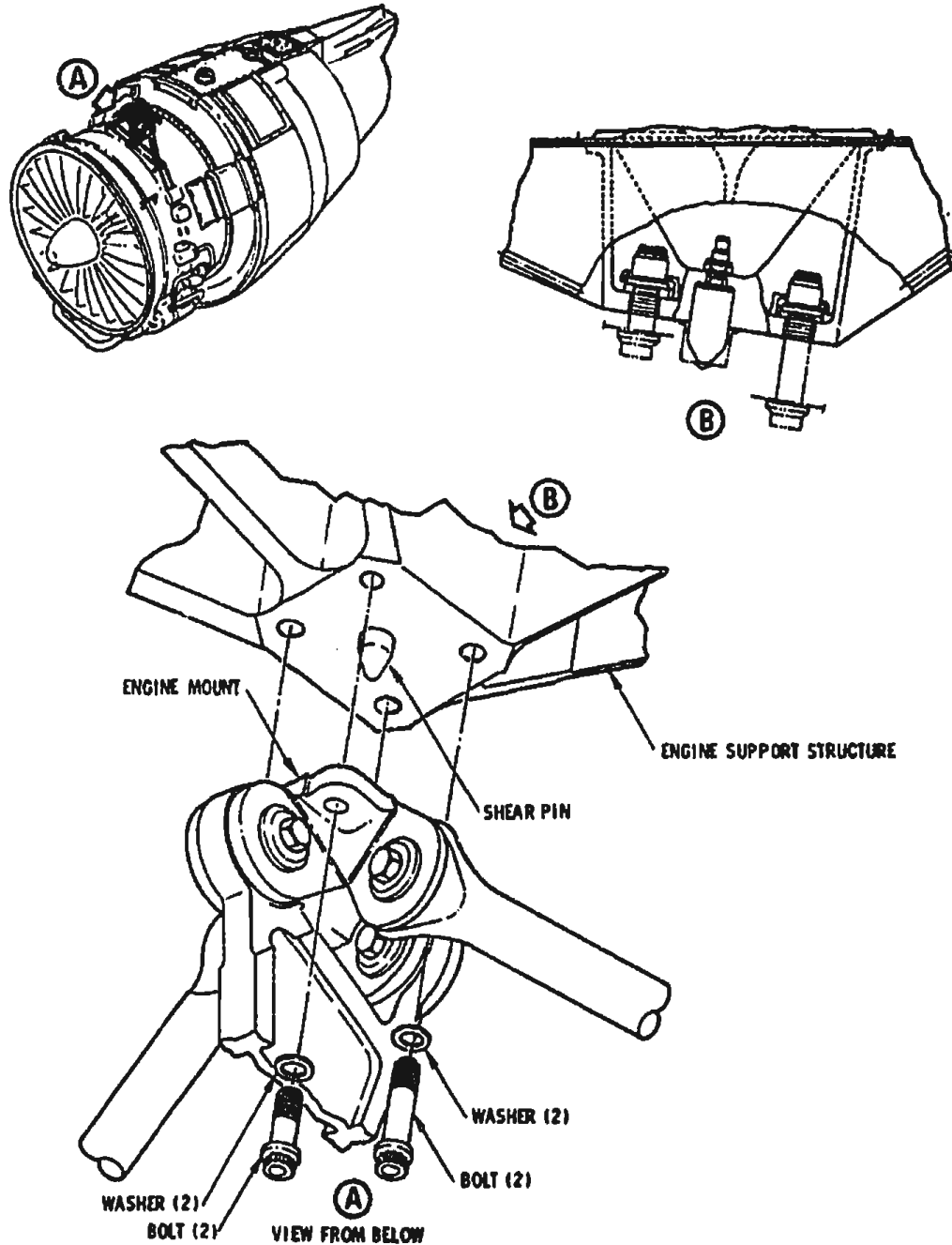
HH 4850
M1-0105-71-405

Engine No. 2 Front Mount
Figure 3 (Sheet 1)

R EFFECTIVITY: 001-014
R
001B

71-20-00
Page 7
Jun 15/93

LOCKHEED
MAINTENANCE MANUAL



MR-0001-71-012

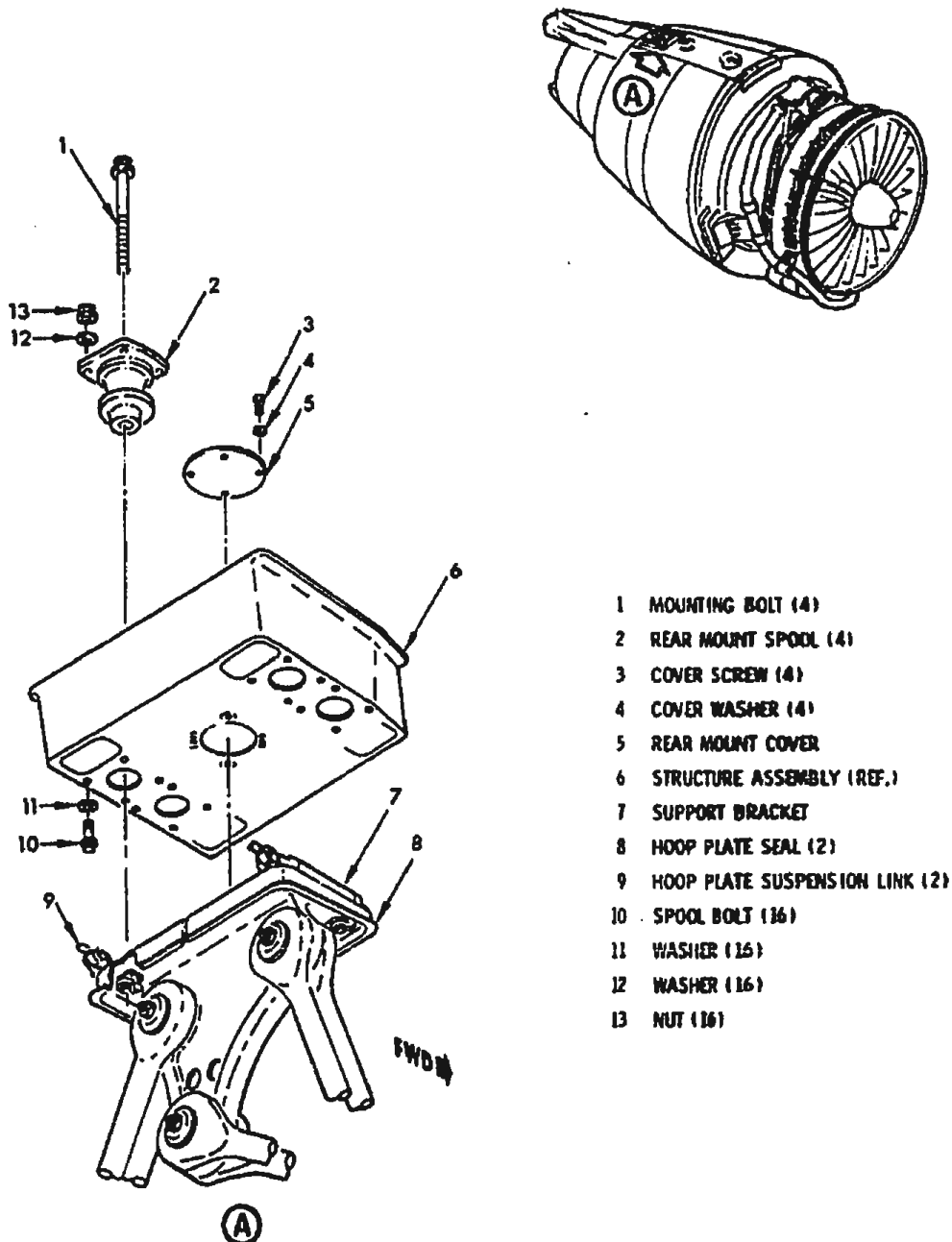
Engine No. 2 Front Mount
Figure 3 (Sheet 2)

R
R
001B

EFFECTIVITY: 015-999

71-20-00
Page 8
Jun 15/93

LOCKHEED
MAINTENANCE MANUAL



- 1 MOUNTING BOLT (4)
- 2 REAR MOUNT SPOOL (4)
- 3 COVER SCREW (4)
- 4 COVER WASHER (4)
- 5 REAR MOUNT COVER
- 6 STRUCTURE ASSEMBLY (REF.)
- 7 SUPPORT BRACKET
- 8 HOOP PLATE SEAL (2)
- 9 HOOP PLATE SUSPENSION LINK (2)
- 10 SPOOL BOLT (16)
- 11 WASHER (16)
- 12 WASHER (16)
- 13 NUT (16)

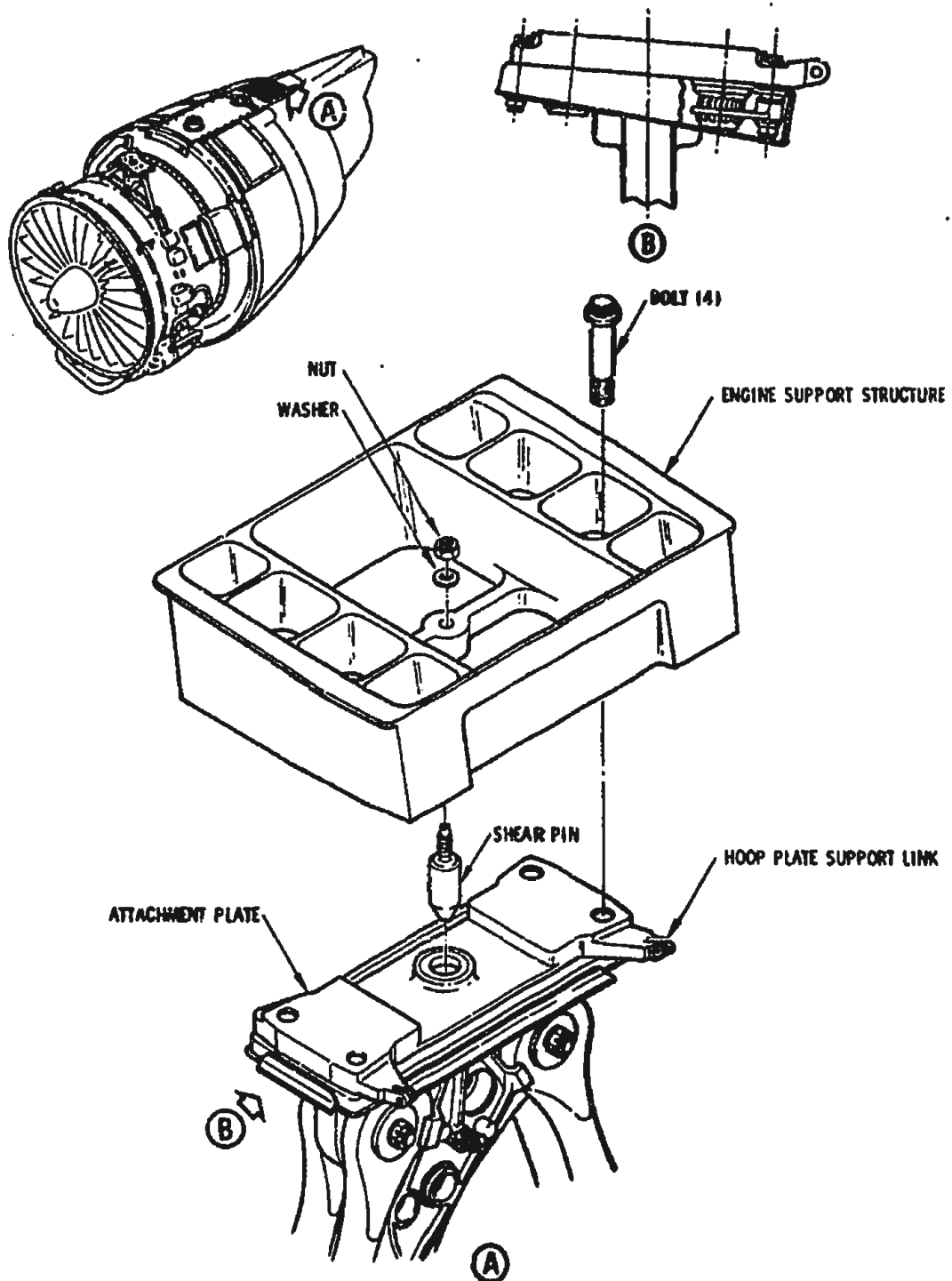
M1-0104-71-411

Engine No. 2 Rear Mount
Figure 4 (Sheet 1)

R EFFECTIVITY: 001-014
R
001B

71-20-00
Page 9
Jun 15/93

LOCKHEED
MAINTENANCE MANUAL



M1-0001-71-013

Engine No. 2 Rear Mount
Figure 4 (Sheet 2)



MAINTENANCE

ENGINE FRONT MOUNT - INSPECTION/CHECK

1. Inspection

A. Inspect Engine Front Mount

(1) Equipment required:

Inspection mirror and lamp

- (2) Remove left-hand hinged cowl 413A or 423A for engines No.1 and 3 (Ref. 71-11-01) or open 433DL for engine No.2 (Ref. 71-12-00). Remove right-hand hinged cowl 414A or 424A for engines No.1 and 3 (Ref. 71-11-02) or open 434DR for engine No.2 (Ref. 71-12-00).
- (3) Using lamp and inspection mirror, inspect right-hand and left-hand support links for corrosion and cracks.
- (4) Inspect right-hand and left-hand support links for security of attachment to support bracket and L.P. compressor case.
- (5) Inspect support bracket for cracks.
- (6) Inspect centre thrust link spherical bearing housing for security of attachment to L.P. compressor case.
- (7) Inspect centre thrust link for cracks.
- (8) Install left-hand hinged cowl 413A or 423A for engines No.1 and 3 (Ref. 71-11-01) or close 433DL for engine No.2 (Ref. 71-12-00). Install right-hand hinged cowl 414A or 424A for engines No.1 and 3 (Ref. 71-11-02) or close 434DR for engine No.2 (Ref. 71-12-00).

B. Acceptance Standards

Cracks found in operations A.(3), (5) and (7) are not acceptable.

Damage within following limitations is acceptable:

- (1) Discolouration caused by surface corrosion on support links provided it does not result in pitting or reduction in section of components.

EFFECTIVITY: ALL



BB.211 Propulsion System

MAINTENANCE

ENGINE REAR MOUNT - - INSPECTION/CHECK

1. Inspection

A. Inspect Engine Rear Mount

(1) Equipment required:

CP.20309 or XUT.37594 Working platform
or (XUT.42526 Spacer
(XUT.42527 Side piece
Inspection mirror and lamp

(2) WARNING: ENSURE THRUST REVERSER SYSTEM IS LOCKED IN FORWARD THRUST POSITION WHILE WORK IS IN PROGRESS.

Deactivate and tag thrust reverser and associated systems and fit thrust reverser mechanical locks (Ref. 78-30-00, Servicing).

(3) Position working platform in cold stream duct.

(4) Enter cold stream duct and remove air motor L.H. access panel 418DL, 428DL or 438DL and air motor R.H. access panel 418DR, 428DR or 438DR (Ref. 72-03-00, Removal/Installation).

(5) Refer to fig.601, using lamp and inspection mirror, inspect left-hand, centre and right-hand links for cracks and corrosion.

(6) Inspect left-hand, centre and right-hand links for security of attachment to support bracket and L.P. turbine bearing and support assembly.

(7) Inspect L.P. turbine bearing and support assembly adjacent to link attachment points for cracks.

(8) Inspect support bracket, where visible, for cracks.

EFFECTIVITY: ALL



RB.211 Propulsion System

MAINTENANCE

- (9) Inspect front and rear stabilizing plates for cracks and for security of attachment to support bracket.
- (10) Inspect front and rear stabilizing plates fork ends.
 - (a) Inspect fork end lugs for cracks or lugs missing.
 - (b) Inspect fork ends for galling at point of contact with links.
- (11) Fit air motor L.H. access panel 418DL, 428DL or 438DL and air motor R.H. access panel 418DR, 428DR or 438DR (Ref. 72-03-00, Removal/Installation).
- (12) Remove working platform from cold stream duct.
- (13) Unlock and reactivate thrust reverser and associated systems (Ref. 78-30-00, Servicing).

B. Acceptance Standards

Cracks found in operations A.(5), (7), (8) and (9) are not acceptable.

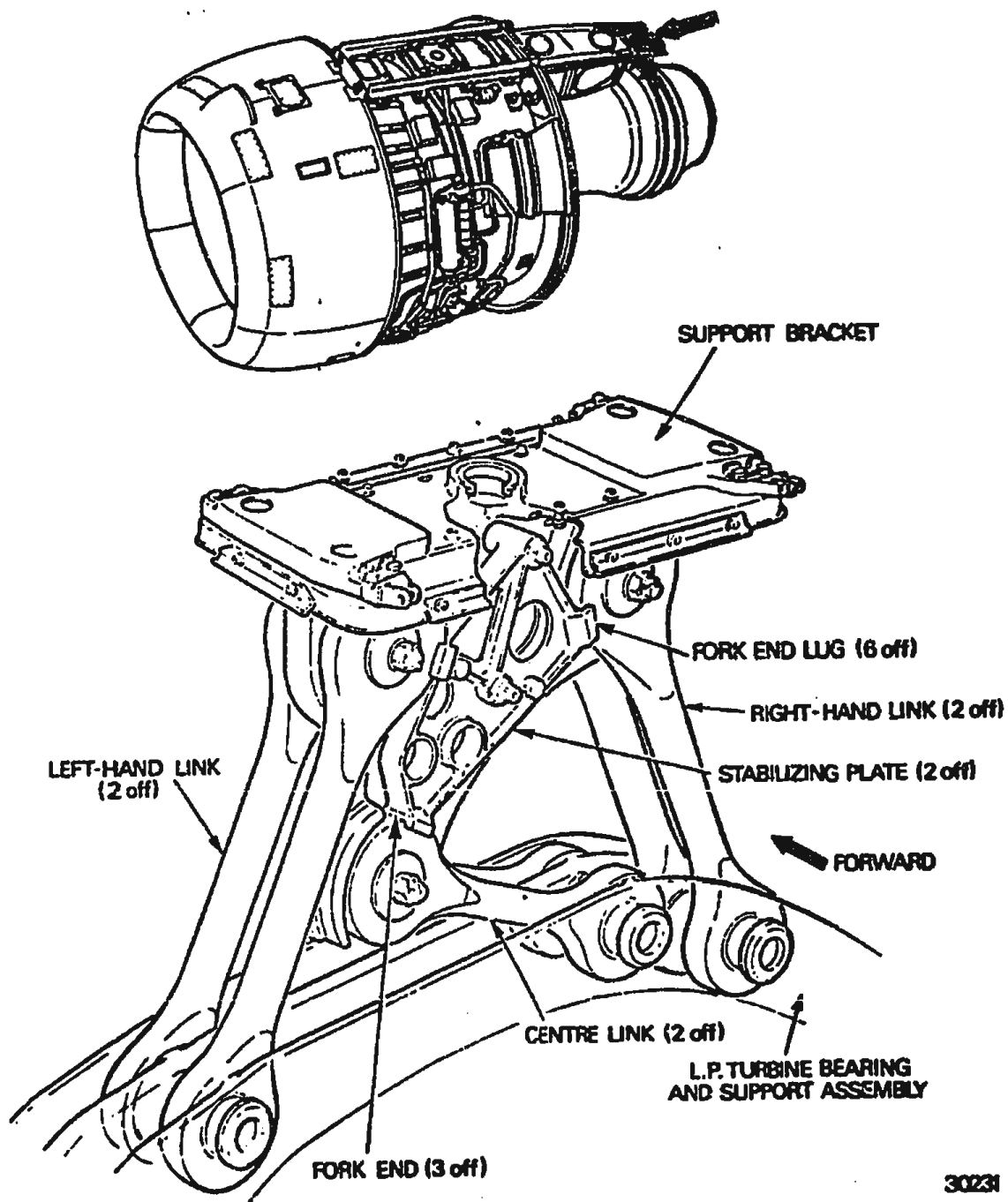
Damage within following limitations is acceptable:

- (1) Discolouration caused by surface corrosion on left-hand, centre and right-hand links provided it does not result in pitting or reduction in section of components.
- (2) Stabilizing plate fork end lugs cracked or missing are acceptable.
- (3) Deleted



RB.211 Propulsion System

MAINTENANCE



30231

Engine rear mount inspection/check
Fig.601

EFFECTIVITY: ALL

LOCKHEED



MAINTENANCE MANUAL

ENGINE NO. 2 FRONT MOUNT SPIDER - REMOVAL AND INSTALLATION

1. Equipment and Materials

Lubricant, MIL-T-5544, or equivalent

2. Referenced Procedure

71-00-03 Fuselage-mounted QEC Unit (Engine No. 2) - Removal and Installation

3. Removal/Installation

A. Removal

- (1) Remove engine No. 2 (Ref. 71-00-03).
- (2) Remove cover screws and engine mount covers (Ref. Fig. 401).
- (3) Remove nuts, washers, and bolts securing front mount spider to structure assembly.

B. Installation

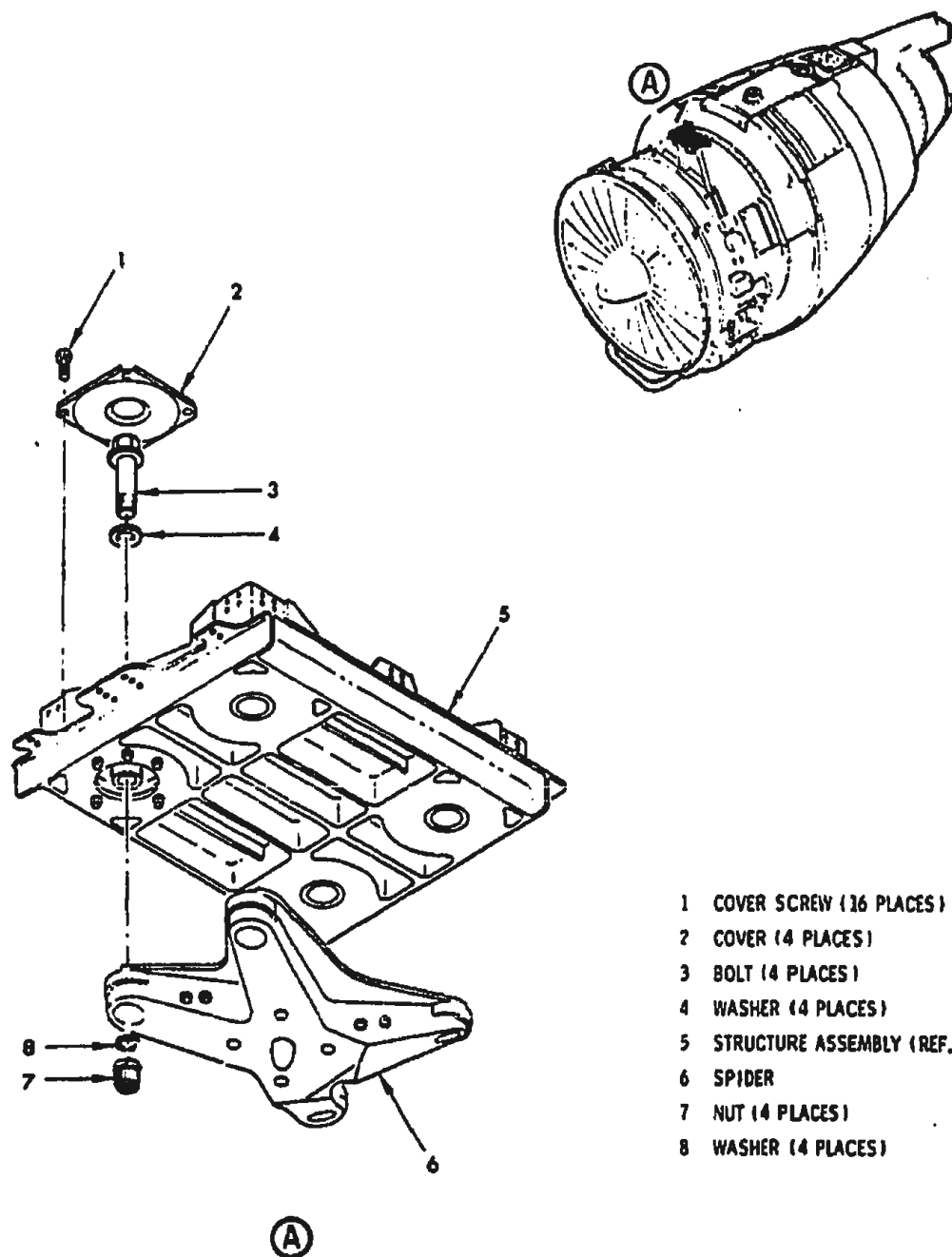
- (1) Lubricate spider mount bolts under bolt head, on shank, and threads.
- (2) Bolt spider mount to structure assembly and torque nuts 650 to 750 lb ft.
- (3) Install engine mount covers with cover screws.
- (4) Install engine No. 2 (Ref. 71-00-03).

. R
R
001B

EFFECTIVITY: 001-014

71-20-06
Page 401
Jun 15/93

LOCKHEED
MAINTENANCE MANUAL



MA 0428
M1-0100-71-450

Engine No. 2 Front Spider Mount - Removal and Installation
Figure 401

REFFECTIVITY: 001-014
001B

71-20-06
Page 402
Jun 15/93

**MAINTENANCE****FIRESEALS - DESCRIPTION AND OPERATION****1. General**

The engine firewall and fireseal, located in zones 412, 422 and 432, in conjunction with flame proof panels and diaphragms fitted in specific engine areas, prevent the spread of flames in the event of an engine external fire. The fireseal and firewall also serve as engine accessory cooling zone dividers (Ref. 75-21-00).

On engines No.1 and No.3 flame proof panels or diaphragms are incorporated in the nose cowl, hinged cowl side panels and hoop plate (Ref. 71-11-00) and also in the combustion section gas generator fairing (Ref. 72-03-00).

On engine No.2 flame proof panels are incorporated in the hoop plate and the combustion section gas generator fairing. Fire proof panels are also incorporated in the engine fixed and hinged cowls (Ref. 71-12-00).

Fig.1 illustrates the position of the firewall and fireseal on the engine.

Service Bulletins referred to:

- S.B.71-2535 - Introduction of five segment fireseal.
- S.B.78-3608 - Introduction of detachable cowl lock indicator housings and provision for reverser locking out/manual wind features.
- S.B.78-3875 - Pressure cylinder with removable sections, giving access to L.H. and R.H. screwjack gearboxes.
- S.B.78-3882 - Detachable firewall and pressure cylinder with removable sections giving access to feedback gearbox.
- S.B.78-4747 - Thrust Reverser - Firewall to fixed structure with improved sealing

R
R

EFFECTIVITY: ALL

050B

1A

71-30-00

Page 1
Jun 15/79



MAINTENANCE

2. Description

- R A. Engine Firewall (engines without S.B.78-3608, S.B.78-3875 and S.B.78-3882).
- R The engine firewall comprises a steel inner firewall
R assembly, a titanium and light alloy pressure cylinder and
R fixed firewall assembly and light alloy upper left hand and
R right hand detachable firewall assemblies (Ref.fig.2
R (Sheet 1)). These components are bolted together and
R secured to the L.P. compressor case rear flange to form
R the engine firewall (Ref. fig.1).
- R B. Engine firewall (engines with S.B.78-3608,
S.B.78-3875 and S.B.78-3882)
- R The engine firewall comprises a steel inner firewall
R assembly, a titanium and light alloy pressure cylinder and
R fixed firewall assembly with detachable access panels and
R upper left hand and right hand portions (S.B.78-3875)
R provided to facilitate access to the centre and upper left
R hand and right hand translating cowl gearboxes
R (Ref. 78-31-17) and light alloy upper left hand and right
R hand detachable firewall assemblies each incorporating a
R cowl lock indicator box assembly (S.B.78-3608) (Ref.fig.2
R (Sheet 2)).
- R On engines with S.B.78-3882, the left hand upper detachable
R firewall assembly and upper left hand pressure cylinder
R upper segments are cut away (Ref fig.2 (Sheet 2)). These
R segments form access panels to the feedback gearbox
R (Ref. 78-31-17).
- R C. On engines with S.B.78-4747, a P section rubber seal,
R spacer and seal retainer are riveted to the upper left hand
R and right hand detachable firewall assemblies seal plate.
- R D. The firewall incorporates cutaway sections to which the
integrated drive generator oil cooler outlet (Ref. 24-11-00),
the air cooled oil cooler outlet (Ref. 72-01-00) and the
hoop plate are secured. The firewall also provides the
rear support for the hinged cowl side panels and support
structure on engines No.1 and No.3 and the hinged and fixed
cowls on engine No.2.
- All tubes, controls and electrical harnesses that pass
through the firewall are sealed to maintain the flame
proofing of the firewall. Typical examples of these seals
are illustrated in fig.1.

EFFECTIVITY: ALL

0508

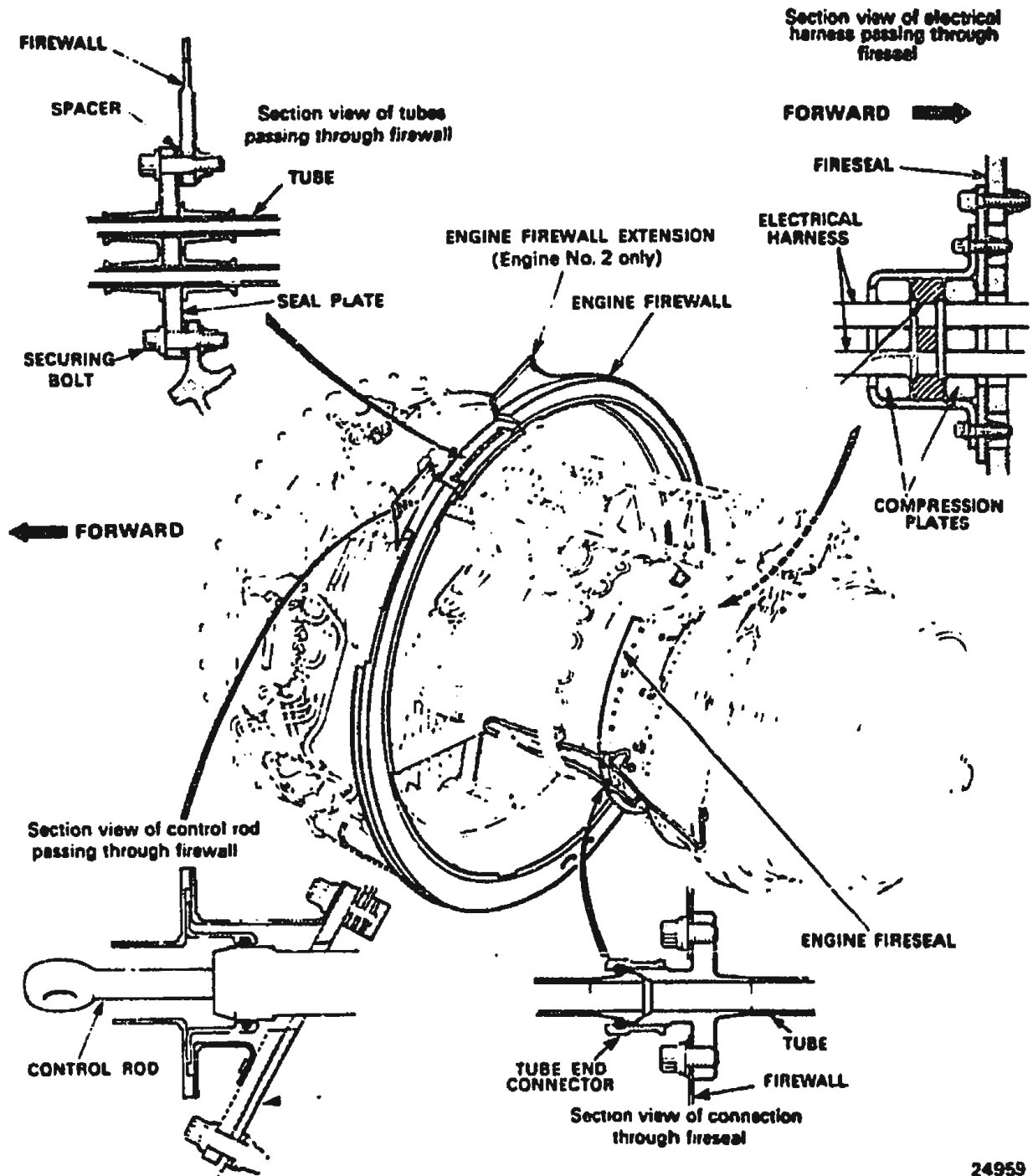
1A

71-30-00
Page 2
Jun 15/79



RB.211 Propulsion System

MAINTENANCE



24959

Engine firewall and fireseal
Fig.1

R
R
050B

EFFECTIVITY: ALL

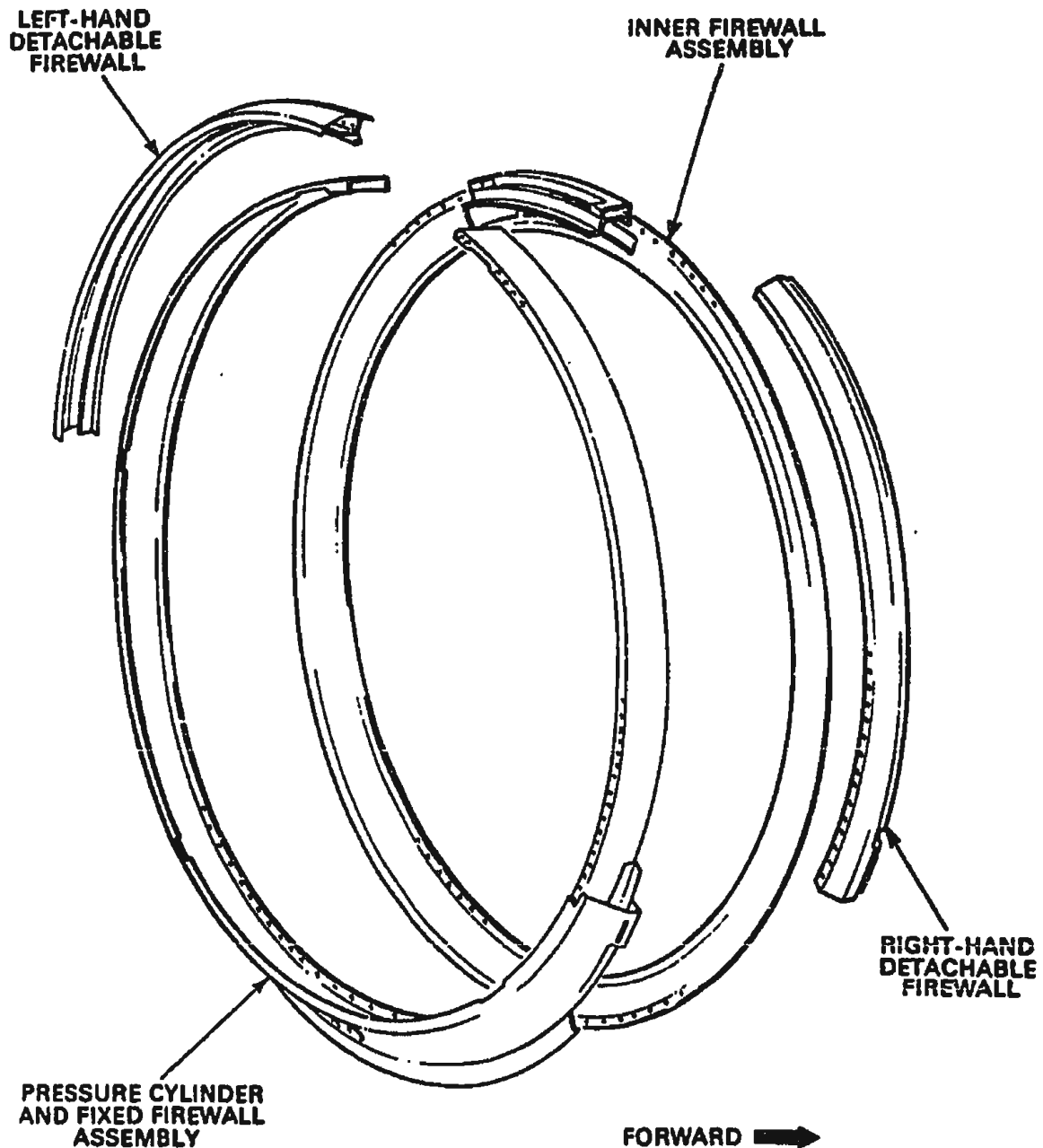
1A

71-30-00
Page 3
Feb 15/78



RB.211 Propulsion System

MAINTENANCE



28851

Engine Firewall (engines without S.B.78-3608, 78-3875
and S.B.78-3882)
Fig.2 (Sheet 1)

R
R
0508

EFFECTIVITY: ALL

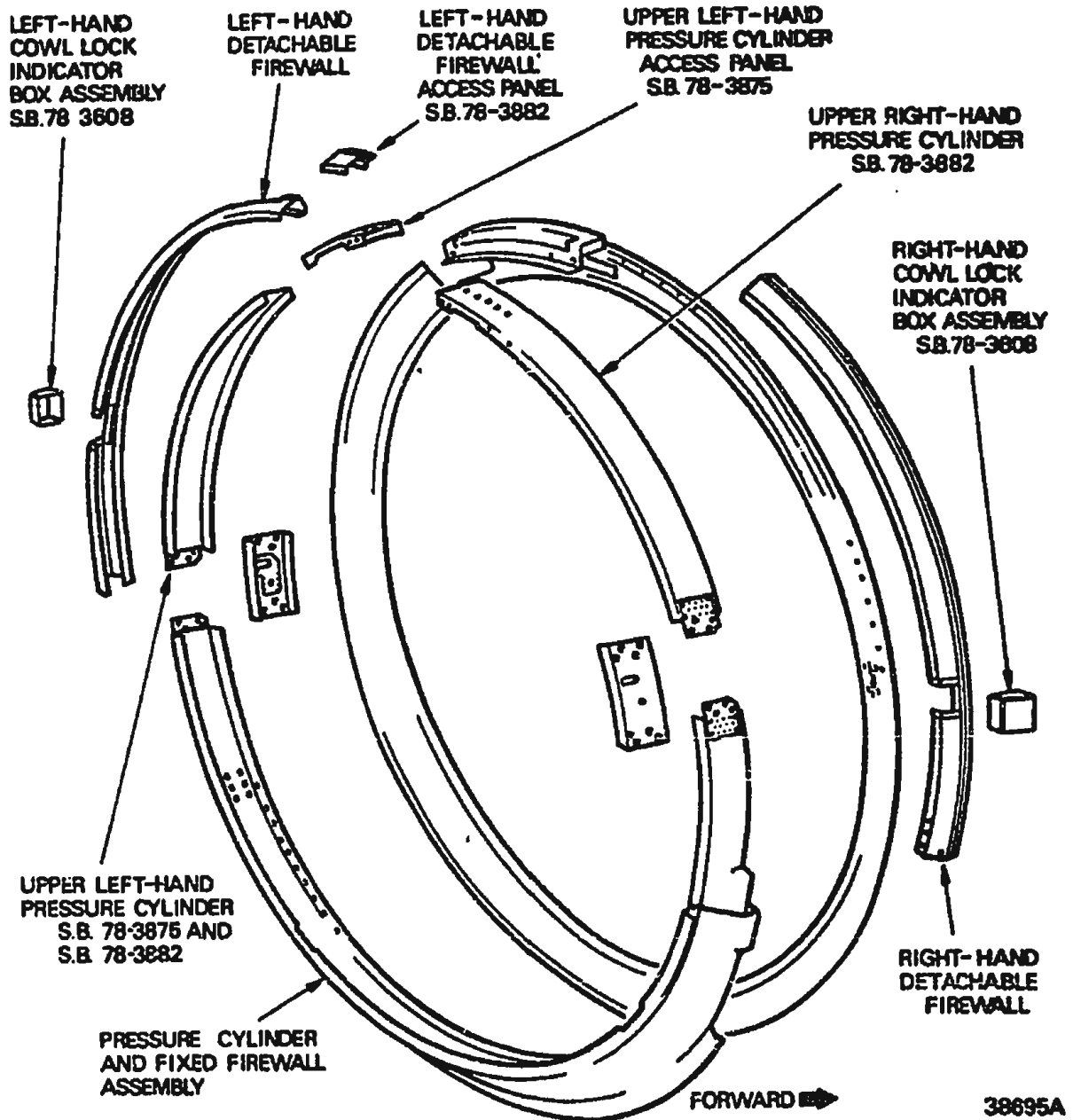
1A

71-30-00
Page 4
Jun 15/79



RB.211 Propulsion System

MAINTENANCE



R
R
R

Engine Firewall (engines with S.B.78-3608, 78-3875
and S.B.78-3882)
Fig.2 (Sheet 2)

EFFECTIVITY: ALL

050B

1A

71-30-00
Page 5
Jun 15/79

**MAINTENANCE****R E. Firewall Extension**

Two firewall extensions (Ref. fig.1) are bolted to the engine firewall on the No.2 engine installation. The extensions are fabricated from titanium and secured to the flange that supports the hinged cowl side panels. A seal attached to the top of each extension mates with the centre engine support structure (Ref. 54-12-00). The outer edge of the extension provides the rear support for the upper hinged cowls (Ref. 71-12-00).

R F. Engine Fireseal

The engine fireseal (Ref. fig.1) consists of three titanium segments supported on brackets secured to the combustion case rear flange. On engines incorporating S.B.71-2535, the engine fireseal consists of five segments. The fireseal mates with the combustion section gas generator fairings to divide the combustion section from the turbine section.

Tubes and electrical harnesses passing through the fireseal are sealed to maintain the flame proofing of the fireseal. Typical examples of these seals are illustrated in fig.1.

EFFECTIVITY: ALL

050B

1A

71-30-00
Page 6
Jun 15/79



RB.211 Propulsion System

MAINTENANCE

ENGINE FIREWALL - REMOVAL/INSTALLATION

1. Remove Firewall and Pressure Cylinder Assembly on engines not incorporating S.B.78-3875

In the event of a thrust reverser system failure that prevents thrust reverser operation to reverse thrust position or the translating cowl being manually cycled rearwards, carry out manual traversing procedure (Ref. 78-31-07).

CAUTION: THE WEIGHT OF EACH DETACHABLE FIREWALL ASSEMBLY IS APPROXIMATELY 11LB. (5 KG.). THE WEIGHT OF THE PRESSURE CYLINDER AND FIREWALL ASSEMBLY IS APPROXIMATELY 26 LB. (12 KG.).

Service Bulletins referred to:

- S.B.36-2441 - Introduction of Thrust Reverser De-activating Valve.
- S.B.71-2278 - Introduction of De-activating Valve Mounting Bracket.
- S.B.71-2662 - L.D. Harness and A.I.D.S. Loom Re-routed to Clear Feedback Linkage.
- S.B.71-2831 - Introduction of Tell-tale Drains System.
- S.B.73-2232 - Introduction of Self-consuming Drains System.
- S.B.78-3608 - Introduction of Detachable Cowl Lock Indicator Housings.
- S.B.78-3875 - Introduction of Engine Firewall - Pressure Cylinder with Removable Sections.
- S.B.78-3882 - Detachable Firewall and Pressure Cylinder with Removable Sections Giving Access to Feedback Gearbox.

R
R

EFFECTIVITY: RB211-22B-02/11

050B

1A

71-30-01

CONFIG-1
Page 401
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

Referenced Procedures:

24-11-08	Oil Cooler - Removal/Installation.
70-02-01	Identification, Lubrication and Fitting of Rubber Sealing Rings.
71-11-01	L.H. Hinged Cowl - Removal/Installation.
71-11-02	R.H. Hinged Cowl - Removal/Installation.
71-12-01	L.H. and R.H. Lower Hinged Cowl - Removal/Installation.
71-12-03	L.H. and R.H. Mid Fixed Cowls - Removal/Installation.
71-12-05	L.H. and R.H. Upper Hinged Cowl - Removal/Installation.
78-30-00	Thrust Reverser - Servicing.
78-31-07	Translating Cowl - Maintenance Practices.
78-31-42	Thrust Reverser De-activation Valve - Maintenance Practices.
79-21-01	Air-cooled Oil Cooler - Maintenance Practices.

Illustrated Parts Catalogue References:

The I.P.C. sections where parts disturbed during the following operations can be located are as follows:

26-11-02	Fire Detection System - Ejector Sensor Assembly.
71-00-00	Centre Engine Cowl Seal Assembly.
71-30-01	Engine Firewall.
71-30-02	No.2 Engine Firewall Extension.
71-70-02	Engine Drain Tubes and Fittings.
71-70-03	Power Plant Drain Tubes and Fittings.

A. Operate thrust reverser to reverse thrust position (Ref. 78-30-00).

B. **WARNING:** ENSURE THRUST REVERSER SYSTEM IS LOCKED IN REVERSE THRUST POSITION WHILE WORK IS IN PROGRESS.

Deactivate and tag thrust reverser and associated systems and fit thrust reverser locks (Ref. 78-30-00).

C. No.1 and No.3 engines

(1) Remove L.H. and R.H. hinged cowls, 413A or 423A (Ref. 71-11-01) and 414A or 424A (Ref. 71-11-02).

R EFFECTIVITY: RB211-22B-02/11

R

050B

1A

71-30-01
CONFIG-1
Page 402
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

D. No.2 engine

- (1) Remove L.H. and R.H. upper hinged cowls, 433DL and 434DR (Ref. 71-12-05).
- (2) Remove L.H. and R.H. lower hinged cowls, 433AL and 434AR (Ref. 71-12-01).
- (3) Remove L.H. and R.H. mid fixed cowls, 433CL and 434CR (Ref. 71-12-03).

E. No.2 engine

- (1) Refer to fig.401, remove bolts (1) then move cowl seal clear of firewall.
- (2) Remove bolts (2) and (3) then withdraw L.H. and R.H. firewall extensions (4) and (5).

F. Remove Upper L.H. Detachable Firewall Assembly

- (1) Refer to fig.402 (Sheet 1 or 2), remove A.C.O.C. outlet duct (Ref. 79-21-01).
- (2) Remove bolts (1) and bolts and washers (2).
- (3) Remove bolts (3) and slacken bolts (4).
- (4) Release fasteners (5) and withdraw upper L.H. detachable firewall assembly (6).
- (5) If the upper L.H. detachable firewall assembly is being replaced by a new firewall assembly on engines incorporating S.B.78-3608, remove the L.H. cowl lock indicator box assembly as detailed in operation 3.C.(5)(f) and retain for fitment to new firewall assembly.

G. Remove Upper R.H. Detachable Firewall Assembly

- (1) Refer to fig.403 (Sheet 1 or 2), on engines incorporating S.B.36-2441 remove deactivation valve (Ref. 78-31-42).

R EFFECTIVITY: RB211-22B-02/11

R

050B

1A

71-30-01

CONFIG-1

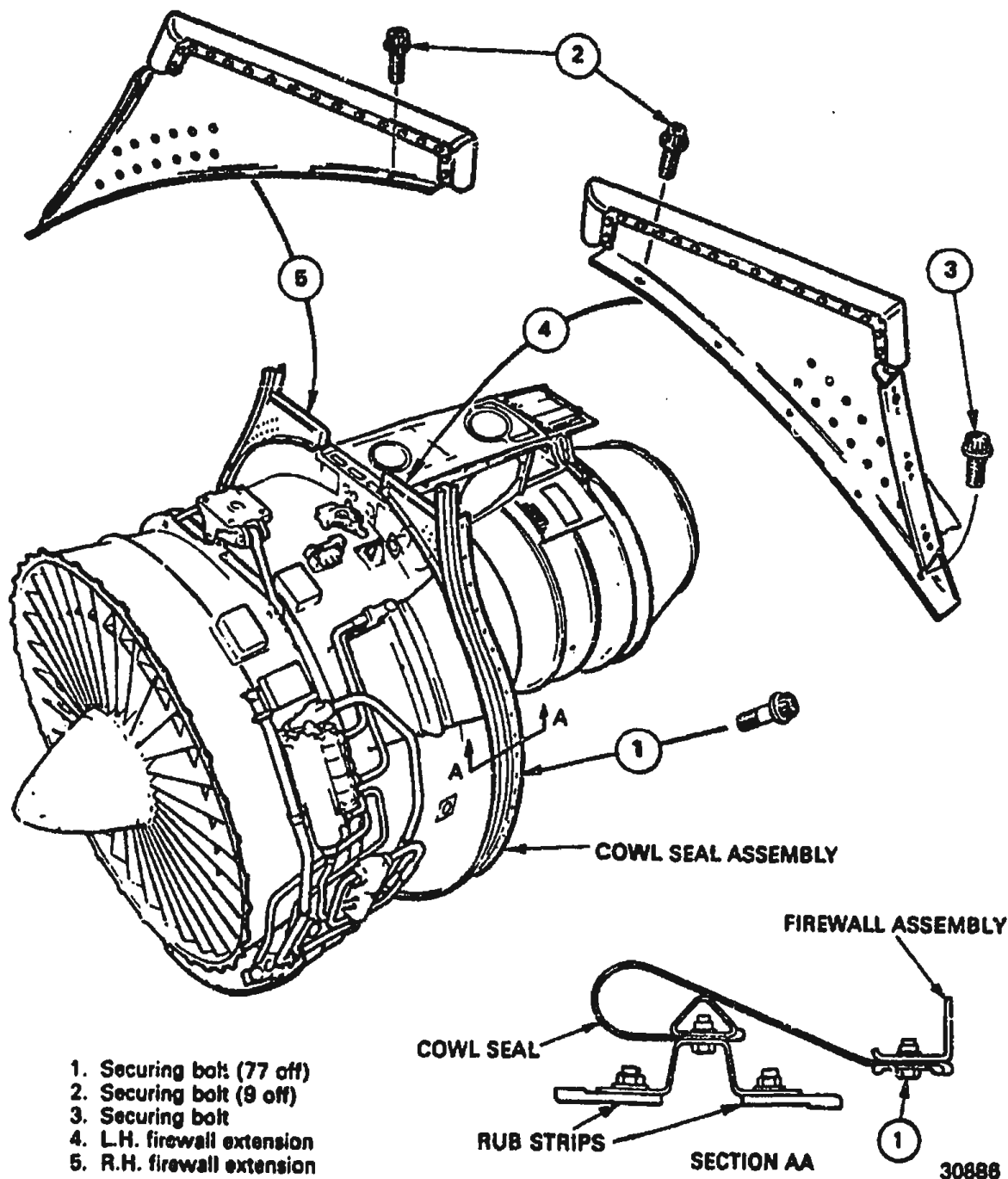
Page 403

Jun 15/94



RB.211 Propulsion System

MAINTENANCE



1. Securing bolt (77 off)
2. Securing bolt (9 off)
3. Securing bolt
4. L.H. firewall extension
5. R.H. firewall extension

No.2 engine firewall extension and cowl seal - Removal/Installation
Fig.401

• R EFFECTIVITY: RB211-22B-02/11

050B

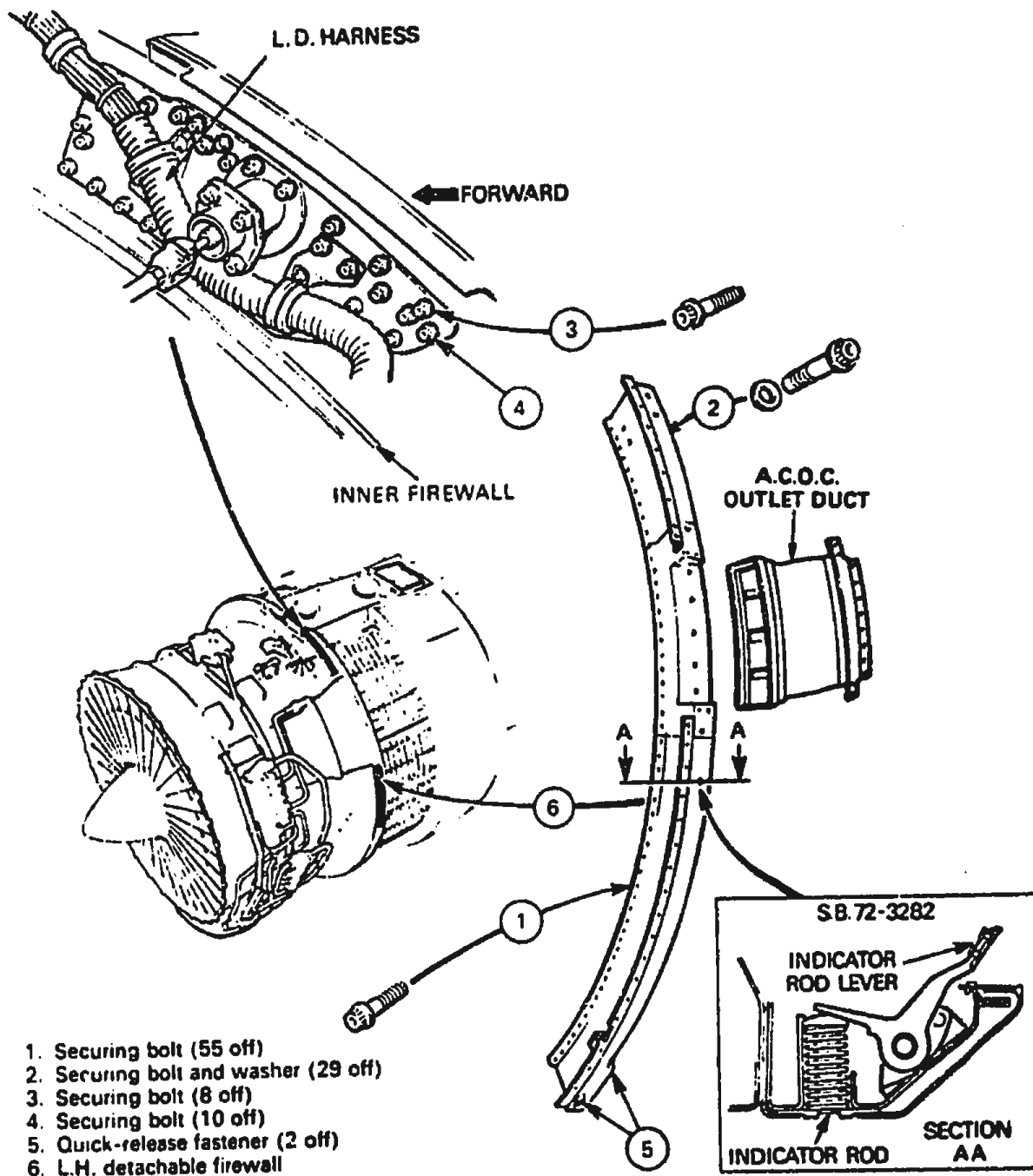
1A

71-30-01
CONFIG-1
Page 404
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



308878

Upper L.H. detachable firewall assembly - Removal/Installation
(Pre S.B.71-2662, S.B.78-3608 and S.B.78-3882)
Fig.402 (Sheet 1)

0508

EFFECTIVITY: RB211-22B-02/11

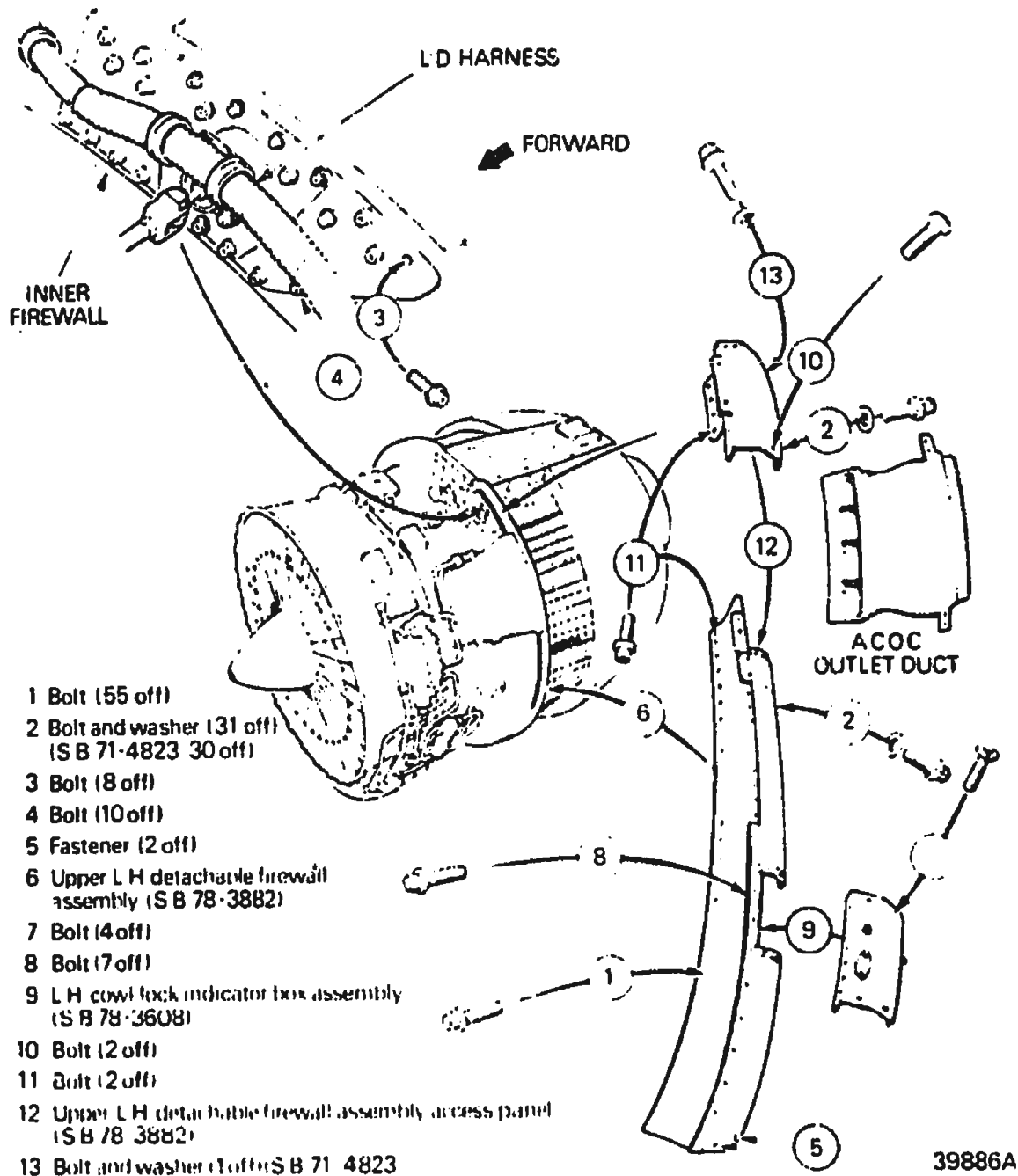
1A

71-30-01
CONFIG-1
Page 405
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



Upper L.H. detachable firewall assembly - Removal/Installation
(S.B.71-2662, S.B.78-3608, S.B.78-3882 and S.B.71-4823)
Fig.402 (Sheet 2)



RB.211 Propulsion System

MAINTENANCE

- (2) On engines incorporating S.B.71-2278, remove bolts and washers (1) and bracket (2).
- (3) Remove bolts (3) and (4) and bolts and washers (5) noting positions of brackets (8) for assembly.
- (4) Release fasteners (6) and withdraw upper R.H. detachable firewall assembly (7).
- (5) If the upper R.H. detachable firewall assembly is being replaced by a new firewall assembly on engines incorporating S.B.78-3608, remove the R.H. cowl lock indicator box assembly as detailed in operation 3.A.(5)(f) and retain for fitment to new firewall assembly.

H. Remove Lower Fixed Firewall and Pressure Cylinder Assembly

- (1) Refer to fig.403 (Sheet 1 or 2), remove I.D.G. oil cooler outlet duct (Ref. 24-11-08).
- (2) Refer to fig.404 (Sheet 1 or 2), disconnect connectors (1), (2) and (3).
- (3) No.2 engine, disconnect connector (4).
- (4) Release fasteners (5) and remove sensor assembly (9).
- (5) Remove bolts and washers (6) noting positions of brackets (7) and (8) for assembly.
- (6) Refer to fig.405, remove bolts and washers (1). Spring pressure cylinder and firewall assembly (2) outward to clear hoop plate and slide rearward to expose inner firewall (3).
- (7) Fit approved blanks to all exposed apertures and connectors.

2. Install Firewall and Pressure Cylinder Assembly on engines not incorporating S.B.78-3875

A. Equipment required:

Clean, stiff-bristled brush

R EFFECTIVITY: RB211-22B-02/11

R

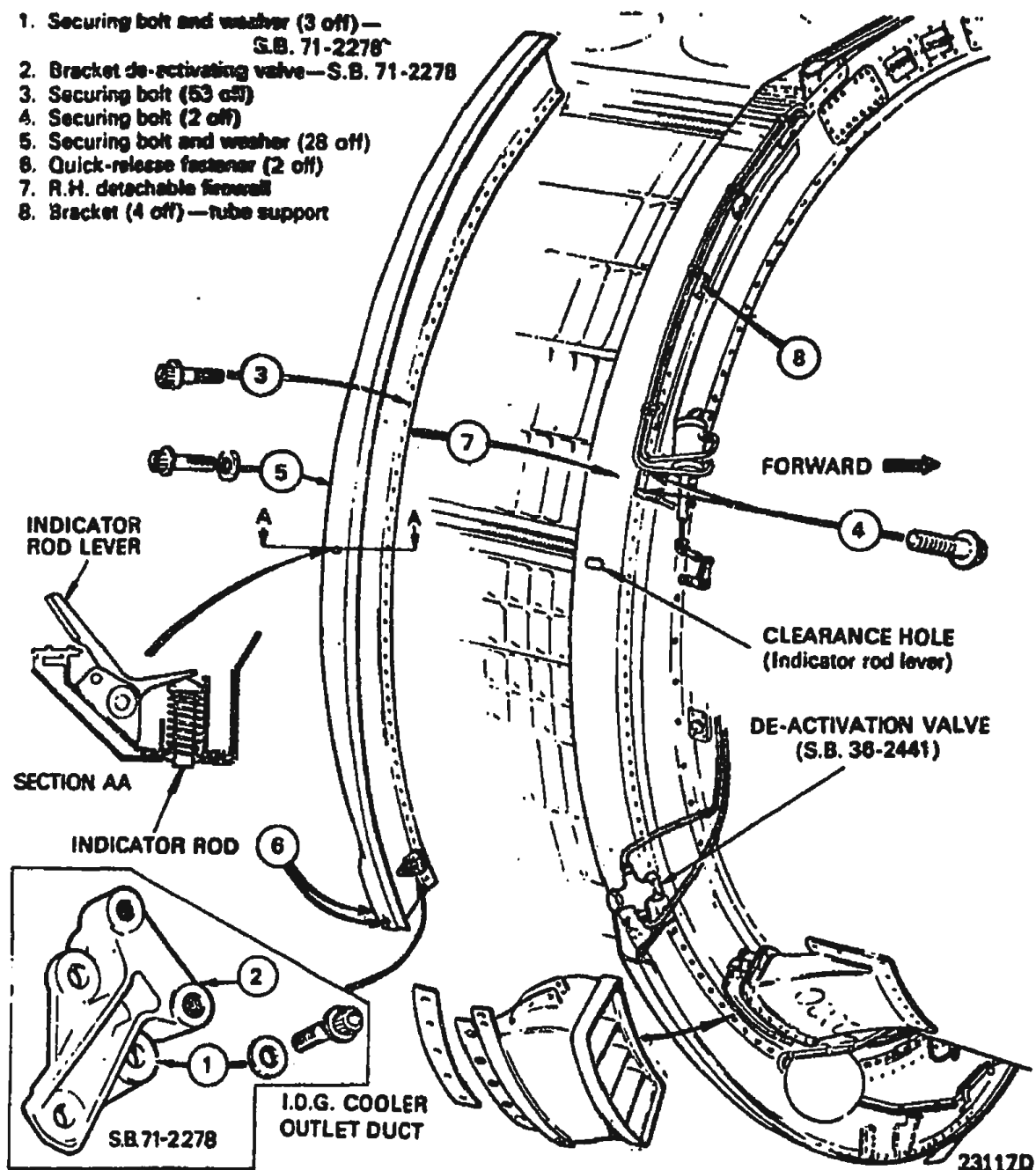
050B

1A

71-30-01
CONFIG-1
Page 407
Jun 15/94

RB.211 Propulsion System **MAINTENANCE**

1. Securing bolt and washer (3 off) —
S.B. 71-2278
2. Bracket de-activating valve—S.B. 71-2278
3. Securing bolt (53 off)
4. Securing bolt (2 off)
5. Securing bolt and washer (28 off)
6. Quick-release fastener (2 off)
7. R.H. detachable firewall
8. Bracket (4 off) —tube support



Upper R.H. detachable firewall assembly - Removal/Installation
 (Pre S.B.78-3608)
 Fig.403 (Sheet 1)

R EFFECTIVITY: RB211-22B-02/11
 R
 050B

1A

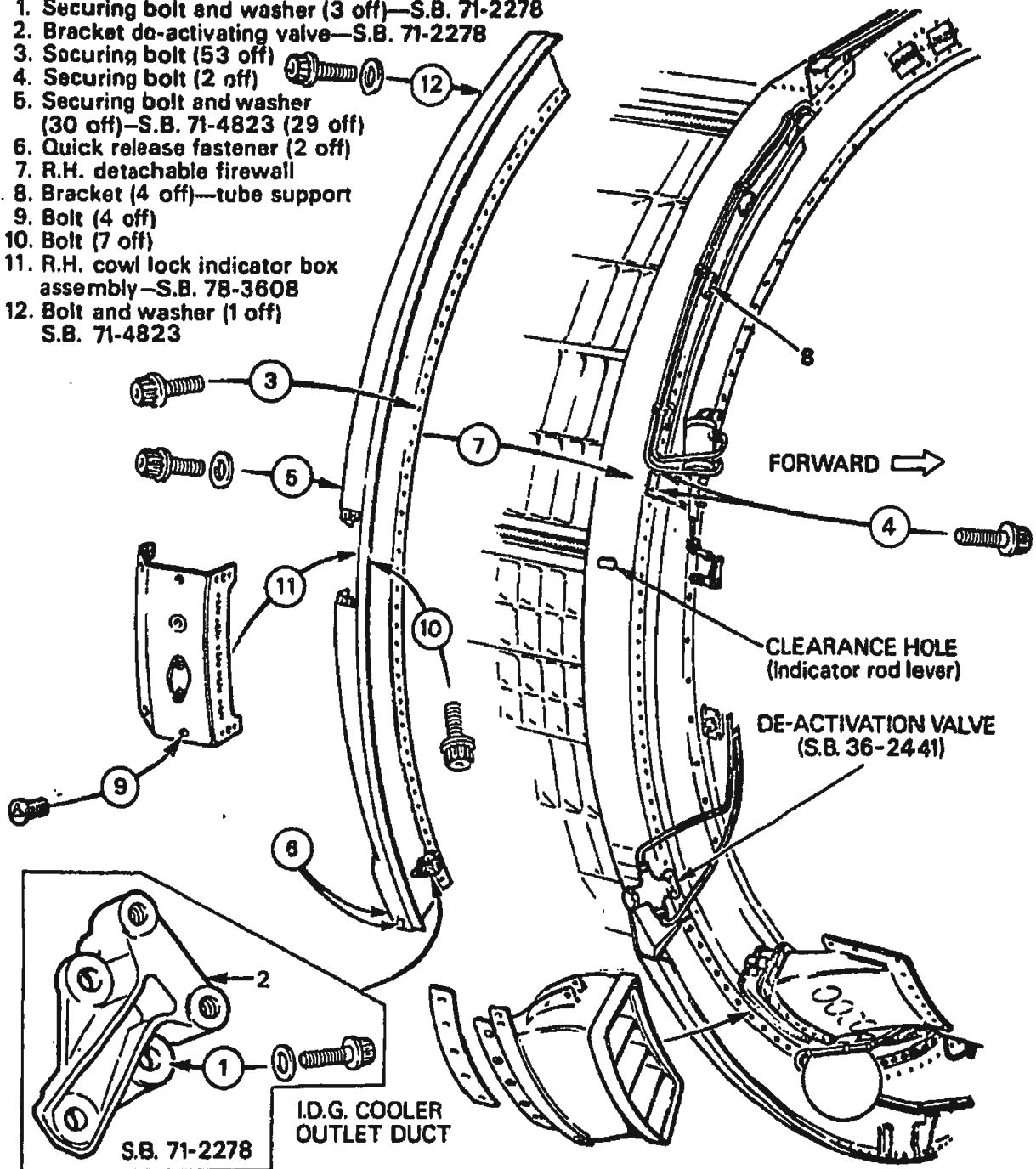
71-30-01
 CONFIG-1
 Page 408
 Nov 15/81



RB.211 Propulsion System

MAINTENANCE

1. Securing bolt and washer (3 off)—S.B. 71-2278
2. Bracket de-activating valve—S.B. 71-2278
3. Securing bolt (53 off)
4. Securing bolt (2 off)
5. Securing bolt and washer (30 off)—S.B. 71-4823 (29 off)
6. Quick release fastener (2 off)
7. R.H. detachable firewall
8. Bracket (4 off)—tube support
9. Bolt (4 off)
10. Bolt (7 off)
11. R.H. cowl lock indicator box assembly—S.B. 78-3608
12. Bolt and washer (1 off) S.B. 71-4823



39887A

Upper R.H. detachable firewall assembly - Removal/Installation
(S.B.78-3608 and S.B.71-4823)
Fig.403 (Sheet 2)

R EFFECTIVITY: RB211-22B-02/11

R

050B

1A

71-30-01
CONFIG-1
Page 409
Nov 15/81



RB.211 Propulsion System

MAINTENANCE

B. Material required:

	British Spec./Ref.	American Spec./Ref.	OMat Item No.
Degreasing fluid (Inhibited and stabilized 1.1.1. trichloroethane)	B.S.4487: 1969	Mil-T-81533	1/21
Jointing compound	PL.32	-	4/46

C. Ensure thrust reverser is locked and systems are deactivated and tagged as detailed in operation 1.B.

D. Remove blanks from all apertures and connectors.

E. WARNING: WHEN USING DEGREASING FLUID, ENSURE ADEQUATE VENTILATION AND AVOID SKIN CONTACT AND INHALING THE VAPOUR.

Cold liquid degrease mating faces of upper L.H. and R.H. detachable firewall assemblies, pressure cylinder and firewall assembly, firewall extensions (No.2 engine only) and inner firewall and allow to dry.

F. Brush apply a thin film of jointing compound to mating faces of upper L.H. and R.H. detachable firewall assemblies, pressure cylinder and firewall assembly, firewall extensions (No.2 engine only) and inner firewall. Allow compound to dry for a minimum period of 10 minutes.

G. Install Lower Fixed Firewall and Pressure Cylinder Assembly

- (1) Refer to fig.405, slide pressure cylinder and firewall assembly (2) forward and position on inner firewall (3) with upper edges located under firewall upper segment; fit and secure bolts and washers (1).
- (2) Refer to fig.404 (Sheet 1 or 2), fit and secure bolts and washers (6) ensuring brackets (7) and (8) are correctly positioned on firewall.
- (3) Fit and lubricate (Ref. 70-02-01) new seal rings to connectors (3), (2) and (1); connect and secure connectors (3), (2) and (1).

R EFFECTIVITY: RB211-22B-02/11

R

050B

1A

71-30-01
CONFIG-1
Page 410
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

- (4) No.2 engine, connect and secure connector (4).
- (5) Refer to fig.403 (Sheet 1 or 2), fit I.D.G. oil cooler outlet duct (Ref. 24-11-08).
- (6) Refer to fig.404 (Sheet 1 or 2), position sensor assembly (9) and secure with fasteners (5).

H. Install Upper R.H. Detachable Firewall Assembly

- (1) If the upper R.H. detachable firewall assembly is replaced by a new firewall assembly on engines incorporating S.B.78-3608, fit the existing R.H. cowl lock indicator box assembly to the new firewall assembly as detailed in operation 3.B.(8)(a).
- (2) Refer to fig.403 (Sheet 1 or 2), position upper R.H. detachable firewall assembly (7) over pressure cylinder and firewall assembly (fig.405, item 2), ensuring indicator rod lever passes through clearance hole in pressure cylinder to seat on topside of lock yoke, depressing the indicator rod lever and extending the indicator rod.
- (3) Fit and secure bolts (3) and (4) and bolts and washers (5) ensuring brackets (8) are correctly positioned on firewall. Secure fasteners (6).
- (4) On engines incorporating S.B.71-2278, position bracket (2) on upper R.H. detachable firewall assembly (7) and secure with bolts and washers (1).
- (5) On engines incorporating S.B.36-2441, fit de-activation valve (Ref. 78-31-42).

J. Install Upper L.H. Detachable Firewall Assembly

- (1) If the upper L.H. detachable firewall assembly is replaced by a new firewall assembly on engines incorporating S.B.78-3608, fit the existing L.H. cowl lock indicator box assembly to the new firewall assembly as detailed in operation 3.D.(8)(a).

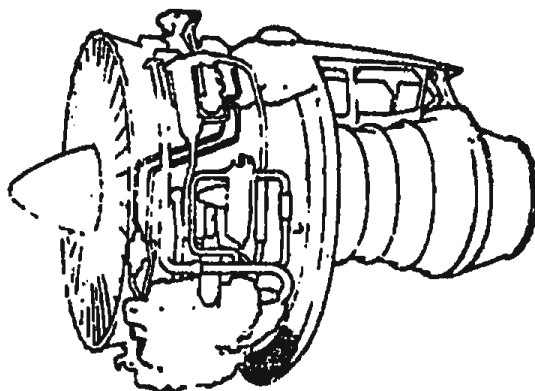
R EFFECTIVITY: RB211-22B-02/11
R

050B

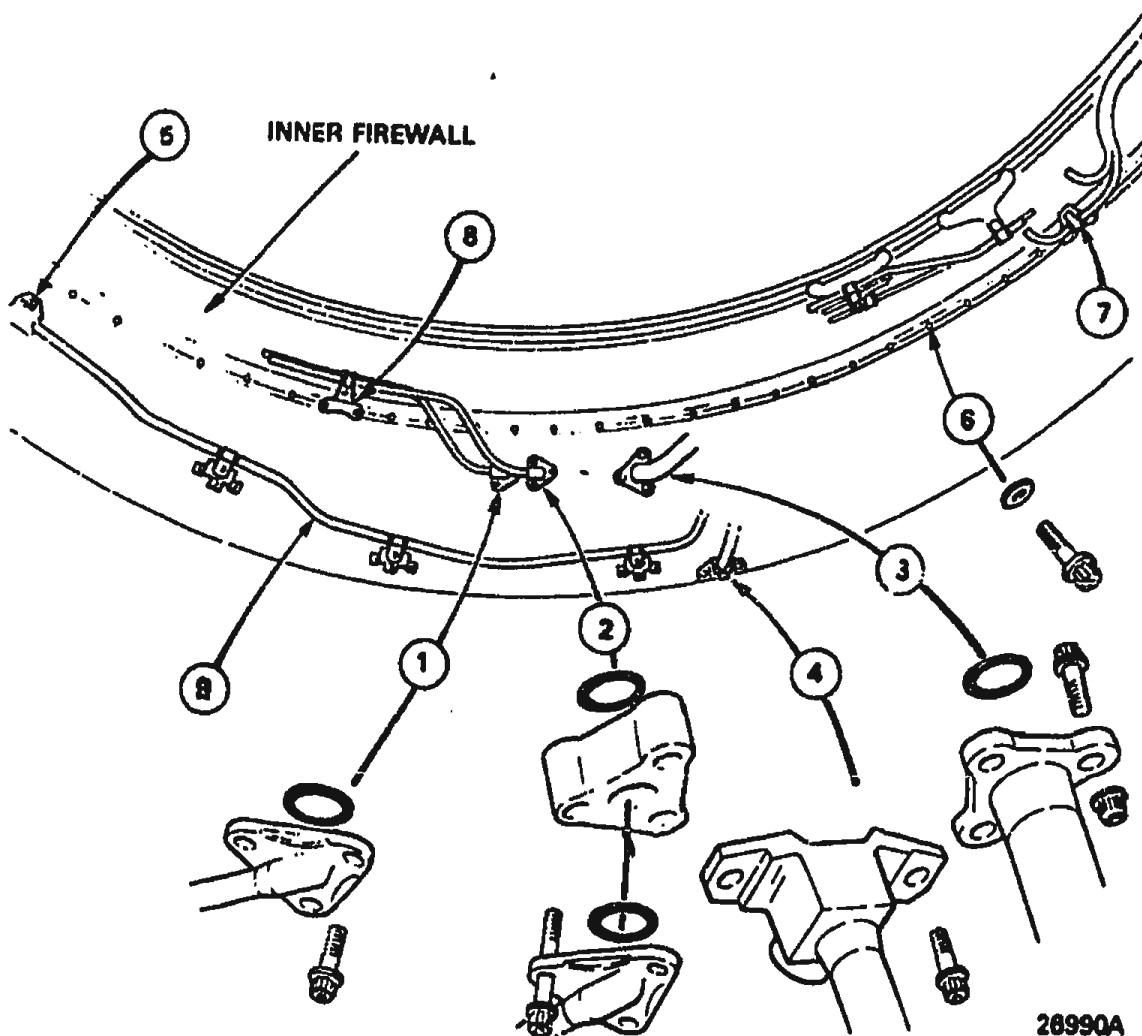
1A

71-30-01
CONFIG-1
Page 411
Jun 15/94

RB.211 Propulsion System
MAINTENANCE



1. Connector—fuel drains tube
2. Connector—oil drains tube
3. Connector—zone 2 vent tube
4. Connector—oil drains sump tube (No. 2 engine)
5. Quick-release fastener (4 off)
6. Securing bolt and washer (52 off)
7. Bracket—harness
8. Bracket—drain tubes support
9. Sensor assembly



Pressure cylinder and firewall assembly lower
disconnect points - Pre S.B.73-2232 and Pre S.B.71-2831
Fig.404 (Sheet 1)

R EFFECTIVITY: RB211-22B-02/11

050B

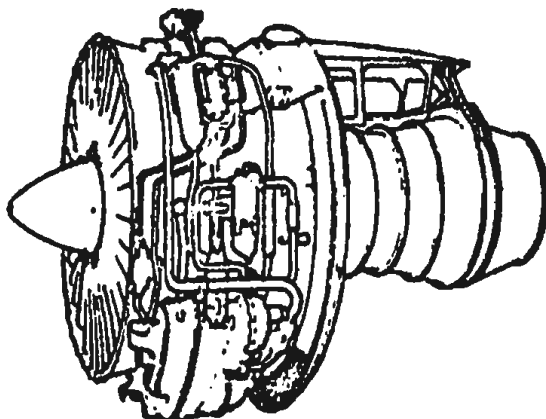
1A

71-30-01
CONFIG-1
Page 412
Nov 15/81

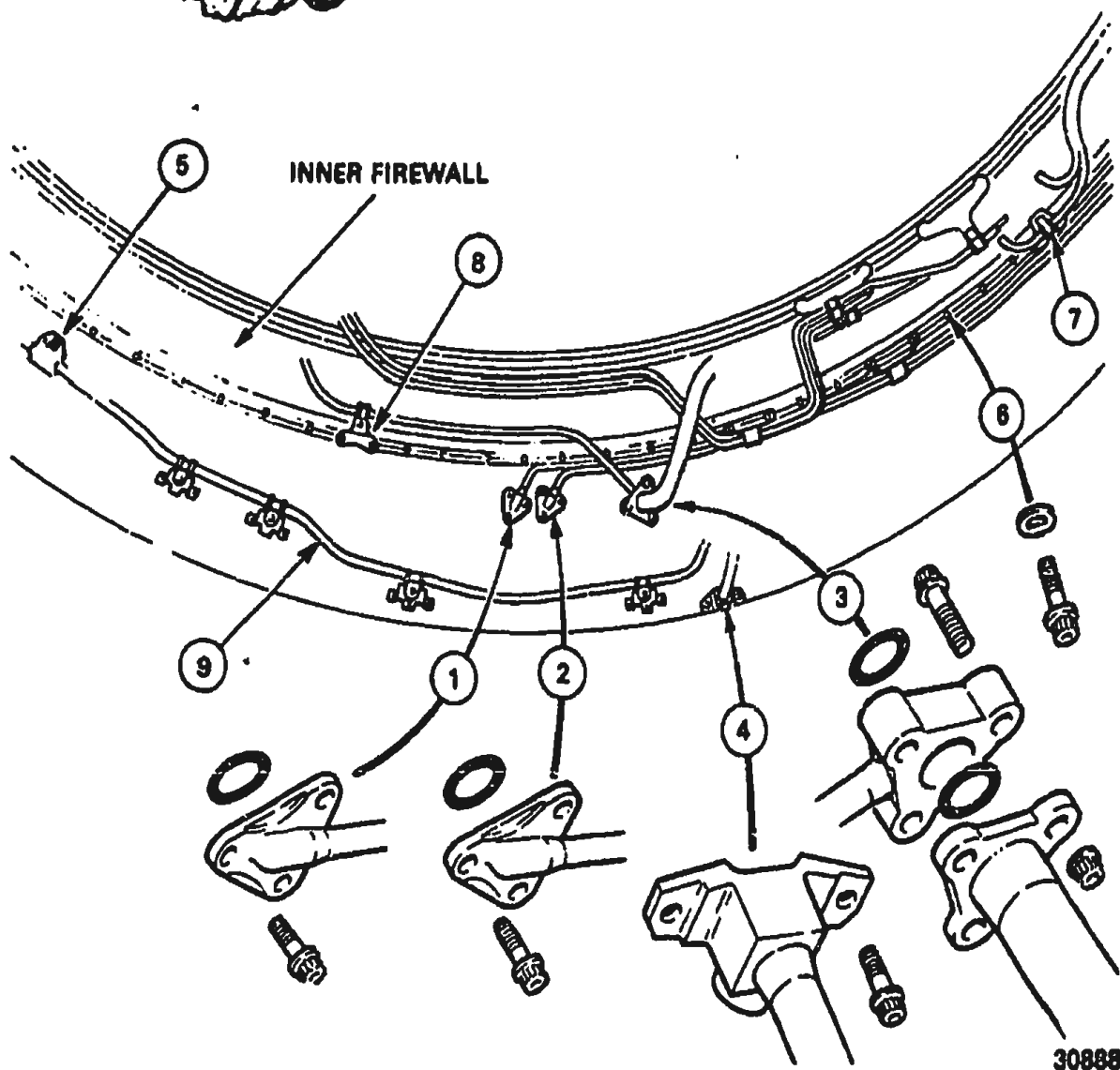


RB.211 Propulsion System

MAINTENANCE



1. Connector—fuel drains tube
2. Connector—oil drains tube
3. Connector—zone 2 vent tube
4. Connector—oil drains sump tube (No. 2 engine)
5. Quick-release fastener (5 off)
6. Securing bolt and washer (62 off)
7. Bracket—harness
8. Bracket—drain tubes support (3 off)
9. Sensor assembly



Pressure cylinder and firewall assembly lower disconnect points - S.B.73-2232 and S.B.71-2831
Fig.404 (Sheet 2)



RB.211 Propulsion System

MAINTENANCE

- (2) Refer to fig.402 (Sheet 1 or 2), position upper L.H. detachable firewall assembly (6) over pressure cylinder and firewall assembly (fig.405, item 2), ensuring indicator rod lever passes through clearance hole in pressure cylinder to seat on topside of lock yoke, depressing the indicator rod lever and extending the indicator rod.
- (3) Fit and secure bolts (1), (3), bolts and washers (2) and fully tighten bolts (4). Secure fasteners (5).
- (4) Fit A.C.O.C. outlet duct (Ref. 79-21-01).

K. No.2 engine

- (1) Refer to fig.401, position L.H. and R.H. firewall extensions (4) and (5) and secure with bolts (3) and (2).
- (2) Position cowl seal on firewall and secure with bolts (1).

L. No.1 and No.3 engines

- (1) Fit L.H. and R.H. hinged cowls, 413A or 423A (Ref. 71-11-01) and 414A or 424A (Ref. 71-11-02).

M. No.2 engine

- (1) Fit L.H. and R.H. upper hinged cowls, 433DL and 434DR (Ref. 71-12-05).
- (2) Fit L.H. and R.H. lower hinged cowls, 433AL and 434AR (Ref. 71-12-01).
- (3) Fit L.H. and R.H. mid fixed cowls, 433CL and 434CR (Ref. 71-12-03).

N. Unlock and reactivate thrust reverser and associated systems (Ref. 78-30-00).

R EFFECTIVITY: RB211-22B-02/11

R

050B

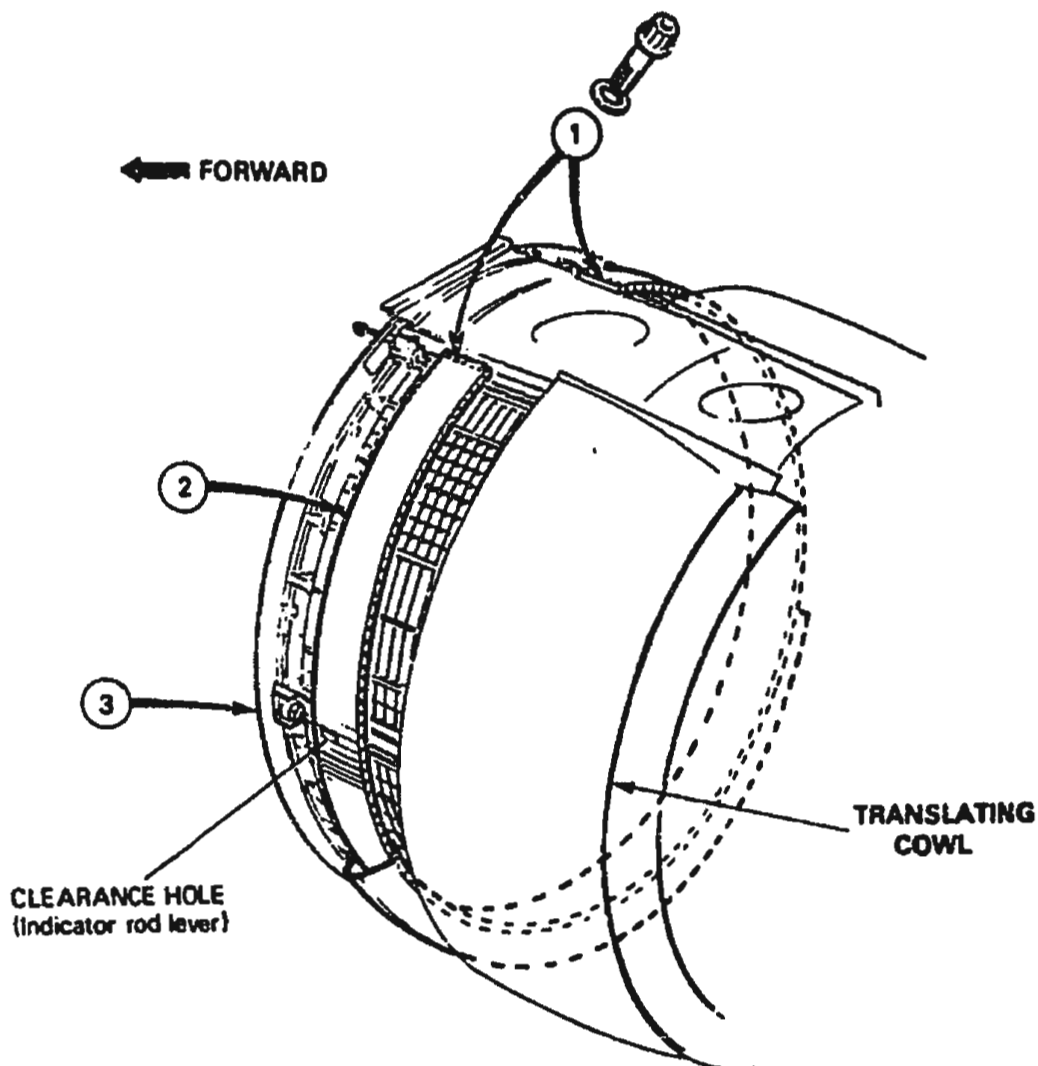
1A

71-30-01
CONFIG-1
Page 414
Jun 15/94



RB.211 Propulsion System

MAINTENANCE



1. Securing bolt and washer (10 off)
2. Pressure cylinder and fixed firewall assembly
3. Inner firewall

23445D

Lower fixed firewall and pressure cylinder assembly -
Removal/Installation (Pre S.B.78-3875)
Fig.405

0508 EFFECTIVITY: RB211-22B-02/11

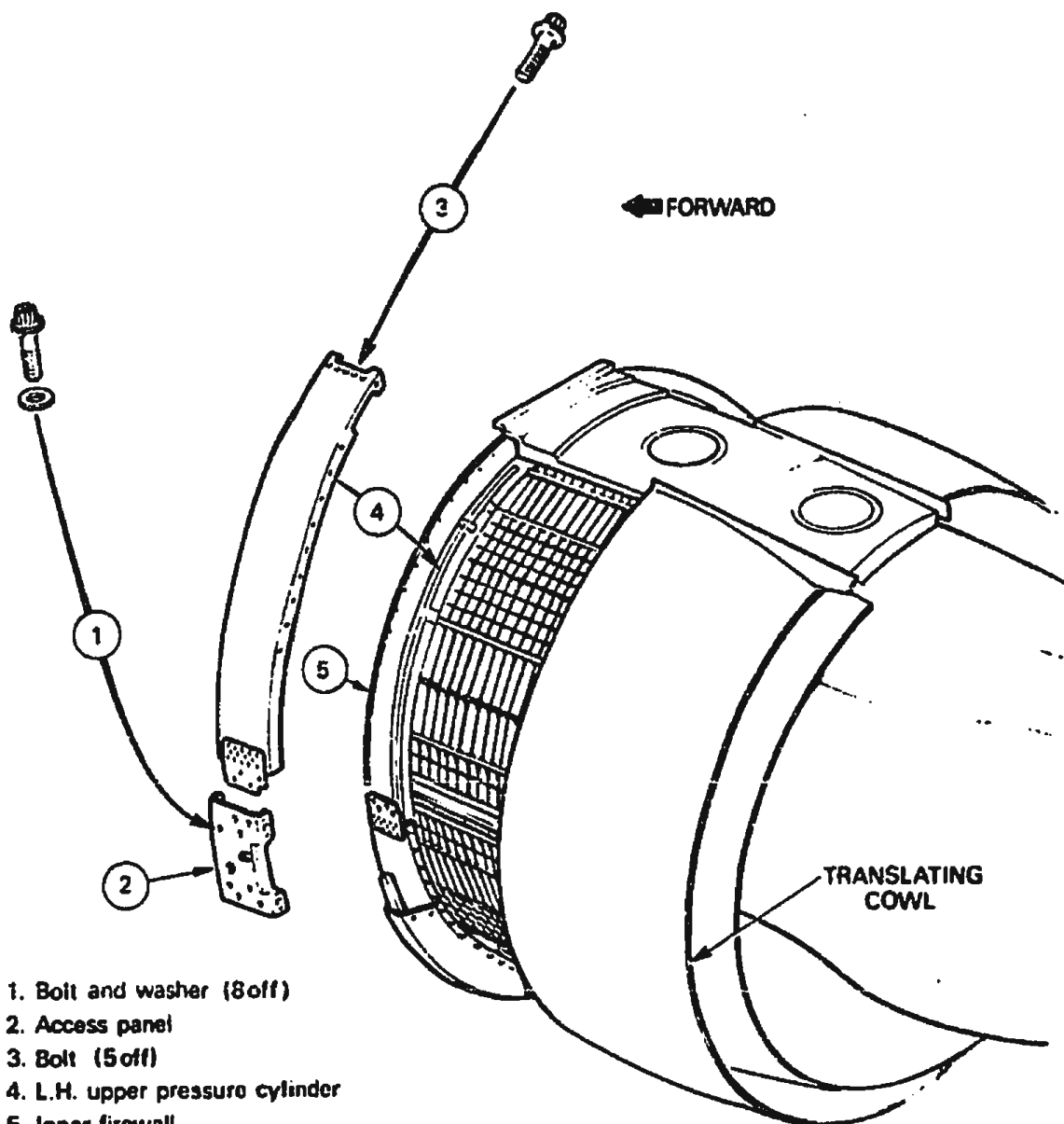
1A

71-30-01
CONFIG-1
Page 415
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



37367A

Upper L.H. pressure cylinder - Removal/Installation
(S.B.78-3875 Pre S.B.78-3882)
Fig.406 (Sheet 1)

050B EFFECTIVITY: RB211-22B-02/11

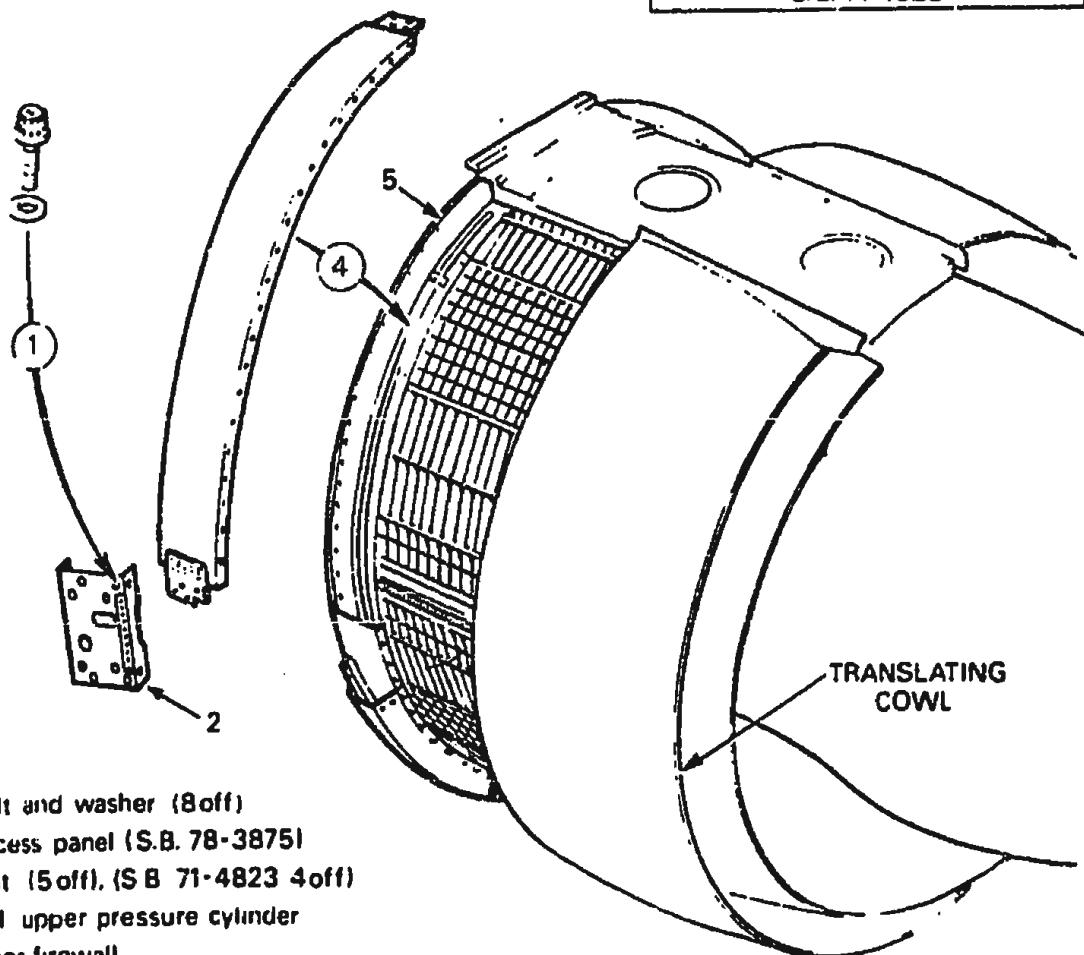
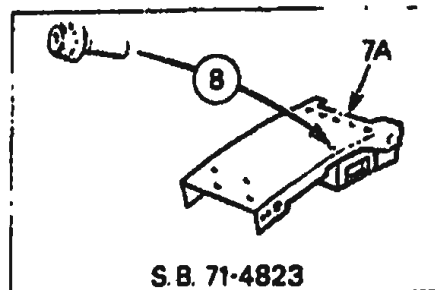
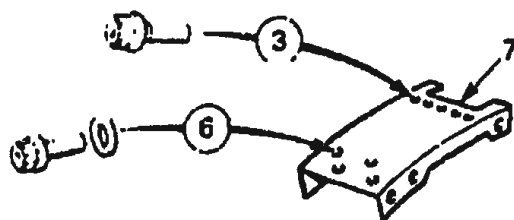
1A

71-30-01
CONFIG-1
Page 416
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



- 1 Bolt and washer (8off)
- 2 Access panel (S.B. 78-3875)
- 3 Bolt (5off), (S B 71-4823 4off)
- 4 L H upper pressure cylinder
- 5 Inner firewall
- 6 Bolt and washer (4off)
- 7 Upper L.H pressure cylinder access panel (S.B. 78-3882)
- 7A. Upper L H pressure cylinder access panel (S B 71-4823)
- 8 Bolts and washers 2off S B 71-4823

39888A

Upper L.H. pressure cylinder - Removal/Installation
(S.B.78-3875, S.B.78-3882 and S.B.71-4823)
Fig.406 (Sheet 2)

R EFFECTIVITY: RB211-22B-02/11

050B

1A

71-30-01

CONFIG-1
Page 417
Nov 15/81



RB.211 Propulsion System

MAINTENANCE

3. Remove Firewall and Pressure Cylinder Assembly on engines incorporating S.B.78-3875

The procedure for gaining access to individual translating cowl gearboxes is contained in the following paragraphs:

R.H. upper (No.1) and centre (No.2) gearboxes - Paragraph A.

L.H. upper (No.6) (engines not incorporating S.B.78-3882) and centre (No.5) gearboxes - Paragraph C.

Lower R.H. (No.3) and L.H. (No.4) gearboxes - Paragraph E.

L.H. upper (No.6) (engines incorporating S.B.78-3882) gearbox - Paragraph G.

NOTE: The translating cowl gearboxes are numerically identified viewed from the rear.

In the event of a thrust reverser system failure that prevents thrust reverser operation to reverse thrust position or the translating cowl being manually cycled rearwards, carry out manual traversing procedure (Ref. 78-31-07).

CAUTION: THE WEIGHT OF EACH DETACHABLE FIREWALL ASSEMBLY IS APPROXIMATELY 11LB. (5 KG). THE WEIGHT OF THE PRESSURE CYLINDER AND FIREWALL ASSEMBLY IS APPROXIMATELY 26LB. (12 KG.).

Service Bulletins referred to:

- S.B.36-2441 - Introduction of Thrust Reverser De-activating Valve.
- S.B.71-2278 - Introduction of De-activating Valve Mounting Bracket.
- S.B.71-2662 - L.D. Harness and A.I.D.S. Loom Re-routed to Clear Feedback Linkage.
- S.B.71-2831 - Introduction of Tell-tale Drains System.
- S.B.71-4823 - Introduction of Upper R.H. and L.H. Pressure Cylinder Sealing Brackets.
- S.B.73-2232 - Introduction of Self-consuming Drains System.
- S.B.78-3608 - Introduction of Detachable Cowl Lock Indicator Housings.
- S.B.78-3875 - Introduction of Engine Firewall - Pressure Cylinder with Removable Sections.
- S.B.78-3882 - Detachable Firewall and Pressure Cylinder with Removable Sections Giving Access to Feedback Gearbox.

R
R

EFFECTIVITY: RB211-22B-02/11

050B

1A

71-30-01
CONFIG-1
Page 418
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

Referenced Procedures:

24-11-08	Oil Cooler - Removal/Installation.
70-02-01	Identification, Lubrication and Fitting of Rubber Sealing Rings.
71-11-01	L.H. Hinged Cowl - Removal/Installation.
71-11-02	R.H. Hinged Cowl - Removal/Installation.
71-12-01	L.H. and R.H. Lower Hinged Cowl - Removal/Installation.
71-12-03	L.H. and R.H. Mid Fixed Cowls - Removal/Installation.
71-12-05	L.H. and R.H. Upper Hinged Cowl - Removal/Installation.
78-30-00	Thrust Reverser - Servicing.
78-31-07	Translating Cowl - Maintenance Practices.
78-31-42	Thrust Reverser De-activation Valve - Maintenance Practices.
79-21-01	Air-cooled Oil Cooler - Maintenance Practices.

Illustrated Parts Catalogue references:

The I.P.C. sections where parts disturbed during the following operations can be located are as follows:

26-11-02	Fire Detection System - Ejector Sensor Assembly.
71-00-00	Centre Engine Cowl Seal Assembly.
71-30-01	Engine Firewall.
71-30-02	No.2 Engine Firewall Extension.
71-70-02	Engine Drain Tubes and Fittings.
71-70-03	Power Plant Drain Tubes and Fittings.

A. Remove Upper R.H. Detachable Firewall Assembly and Pressure Cylinder

(1) Operate thrust reverser to reverse thrust position (Ref. 78-30-00).

(2) **WARNING:** ENSURE THRUST REVERSER SYSTEM IS LOCKED IN REVERSE THRUST POSITION WHILE WORK IS IN PROGRESS.

Deactivate and tag thrust reverser and associated systems and fit thrust reverser locks (Ref. 78-30-00).

R
R

EFFECTIVITY: RB211-228-02/11

050B

1A

71-30-01
CONFIG-1
Page 419
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

- (3) No.1 and No.3 engines**
 - (a)** Remove R.H. hinged cowl 414A or 424A (Ref. 71-11-02).
- (4) No.2 engine**
 - (a)** Remove L.H. and R.H. upper hinged cowls, 433DL and 434DR (Ref. 71-12-05).
 - (b)** Remove L.H. and R.H. lower hinged cowls, 433AL and 434AR (Ref. 71-12-01).
 - (c)** Remove L.H. and R.H. mid fixed cowls, 433CL and 434CR (Ref. 71-12-03).
 - (d)** Refer to fig.401, remove bolts (1) then move cowl seal clear of firewall.
 - (e)** Remove bolts (2) then remove R.H. firewall extension (5).
- (5) Remove Upper R.H. Detachable Firewall Assembly**
 - (a)** Refer to fig.403 (Sheet 1 or 2), on engines incorporating S.B.36-2441 remove deactivation valve (Ref. 78-31-42).
 - (b)** On engines incorporating S.B.71-2278, remove bolts and washers (1) and bracket (2).
 - (c)** Remove bolts (3) and (4) and bolts and washers (5) noting positions of brackets (8) for assembly.
 - (d)** On engines with S.B.71-4823, remove bolt and washer (12), refer to fig.403 (sheet 2).
 - (e)** Release fasteners (6) and remove upper R.H. detachable firewall assembly (7).
 - (f)** If the upper R.H. detachable firewall assembly is being replaced by a new firewall assembly on engines incorporating S.B.78-3608, remove the R.H. cowl lock indicator box assembly as follows:

Refer to fig.403 (Sheet 2), remove bolts (9) and (10) then remove R.H. cowl lock indicator box assembly (11) and retain for fitment to new firewall assembly.

R EFFECTIVITY: RB211-22B-02/11
R

050B

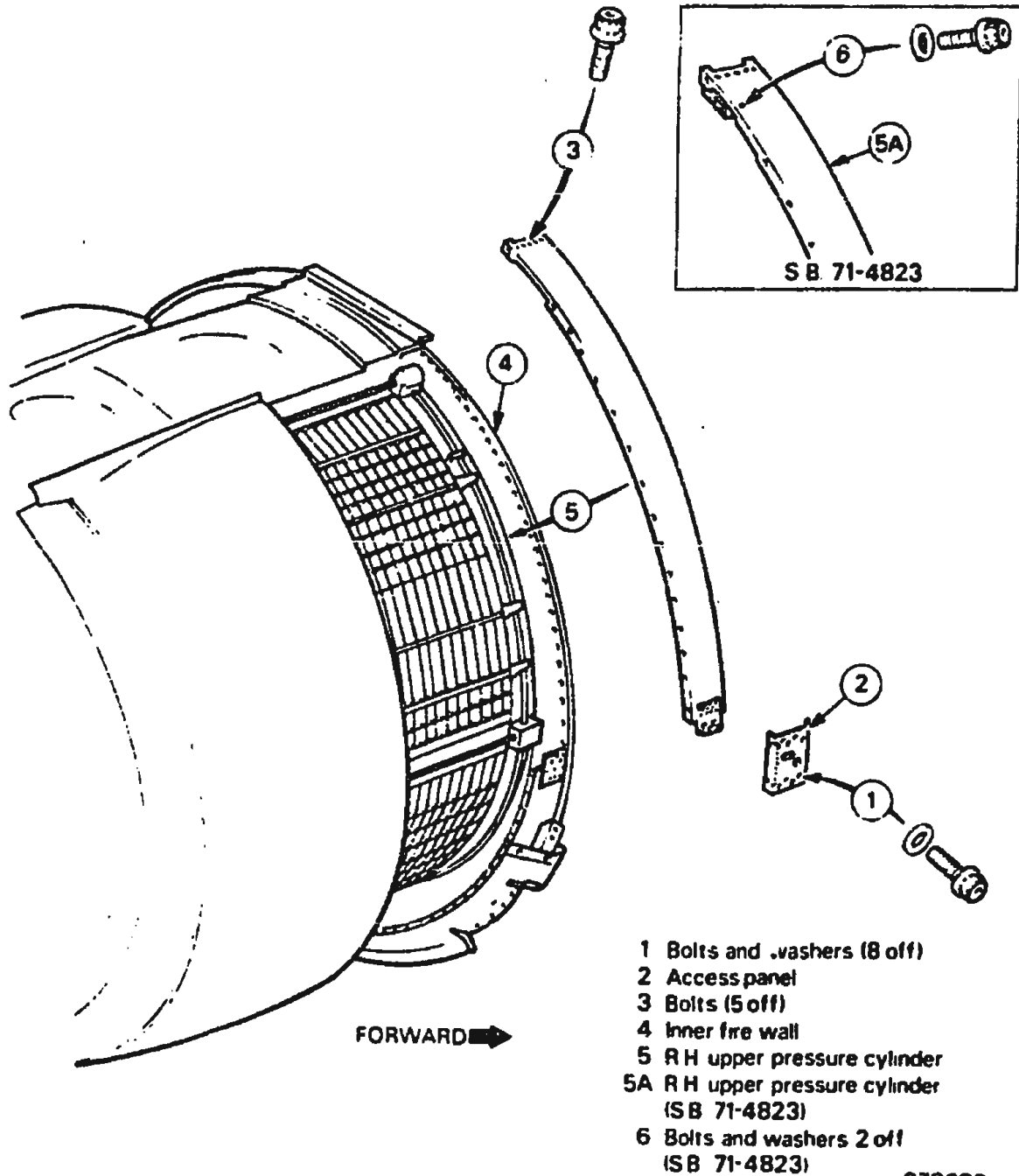
1A

71-30-01
CONFIG-1
Page 420
Jun 15/94



RB.211 Propulsion System

MAINTENANCE



37368B

Upper R.H. pressure cylinder - Removal/Installation
(S.B.78-3875 and S.B.71-4823)
Fig.407

050B EFFECTIVITY: RB211-22B-02/11

1A

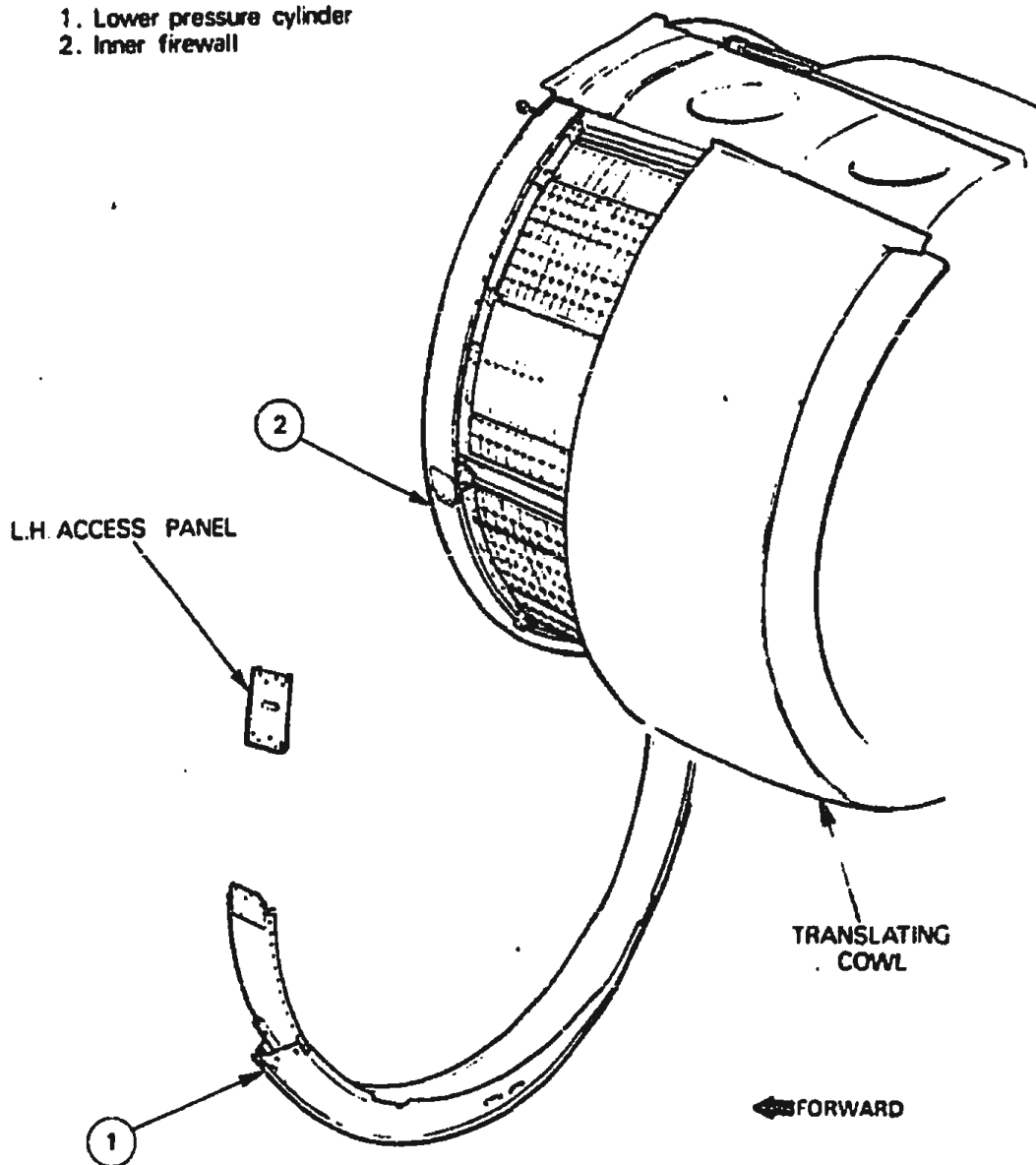
71-30-01
CONFIG-1
Page 421
Nov 15/81



RB.211 Propulsion System

MAINTENANCE

1. Lower pressure cylinder
2. Inner firewall



37369A

Lower fixed firewall and pressure cylinder assembly -
Removal/Installation (S.B.78-3875)
Fig.408

0508 EFFECTIVITY: RB211-22B-02/11

1A

71-30-01
CONFIG-1
Page 422
Nov 15/81



RB.211 Propulsion System

MAINTENANCE

(6) Remove upper R.H. pressure cylinder

- (a) Refer to fig.407, remove bolts and washers (1) then access panel (2).
- (b) Remove the bolts (3) and withdraw the upper R.H. pressure cylinder (5) from the inner firewall (4).
- (c) On engines with S.B.71-4823 remove bolts (3) and withdraw upper R.H. pressure cylinder (5A) from inner firewall (4).
- (d) If pressure cylinder (5A) is being replaced by a new pressure cylinder remove sealing bracket as follows:

Remove bolts and washers (6) and retain sealing bracket for fitment to new pressure cylinder (5A), refer to fig.407.
- (e) Fit approved blanks to all exposed apertures and connectors.

B. Install Upper R.H. Detachable Firewall Assembly and Pressure Cylinder

(1) Equipment required:

Clean, stiff-bristled brush

(2) Material required:

	British Spec./Ref.	American Spec./Ref.	OMat Item No.
Degreasing fluid (Inhibited 1.1.1. trichloroethane)	B.S.4487 1969	Mil-T-81533	1/21
Jointing compound	PL.32	-	4/46

R
R

EFFECTIVITY: RB211-22B-02/11

050B

1A

71-30-01
CONFIG-1
Page 423
Jun 15/94

R **RB.211** Propulsion System
MAINTENANCE

- (3) Ensure thrust reverser is locked and systems are deactivated and tagged as detailed in operation 3.A.(2).
- (4) Remove blanks from all connectors and apertures.
- (5) **WARNING:** WHEN USING DEGREASING FLUID, ENSURE ADEQUATE VENTILATION AND AVOID SKIN CONTACT AND INHALING THE VAPOUR.
Cold liquid degrease mating faces of upper R.H. detachable firewall assembly, upper R.H. pressure cylinder, R.H. firewall extension (No.2 engine only) and inner firewall and allow to dry.
- (6) Brush apply a thin film of jointing compound to mating faces of upper R.H. detachable firewall assembly, upper R.H. pressure cylinder, R.H. firewall extension (No.2 engine only) and inner firewall. Allow compound to dry for a minimum period of 10 minutes.
- (7) Install Upper R.H. Pressure Cylinder
 - (a) If upper R.H. pressure cylinder is being replaced by a new pressure cylinder on engines with S.B.71-4823, fit upper R.H. pressure cylinder sealing bracket to new pressure cylinder as follows:

Fit sealing bracket to upper R.H. pressure cylinder (5A) and secure with bolts and washers (6), refer to fig.407.
 - (b) Fit the upper R.H. pressure cylinder (5) to inner firewall (4) and secure with bolts (3).
 - (c) On engines with S.B.71-4823 fit upper R.H. pressure cylinder (5A) to inner firewall (4) and secure with bolts (3).
 - (d) Fit access panel (2) to the pressure cylinder and secure with bolts and washers (1).

R EFFECTIVITY: RB211-22B-02/11
R

050B

1A

71-30-01
CONFIG-1
Page 424
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

(8) Install Upper R.H. Detachable Firewall Assembly

- (a) If the upper R.H. detachable firewall assembly is being replaced by a new firewall assembly on engines incorporating S.B.78-3608, fit the existing R.H. cowl lock indicator box assembly as follows:**

Refer to fig.403 (Sheet 2), fit the R.H. cowl lock indicator box assembly (11) to the upper R.H. detachable firewall assembly (7) then fit and secure bolts (9) and (10).

- (b) Refer to fig.403 (Sheet 1 or 2), position upper R.H. detachable firewall assembly (7) over pressure cylinder assembly, ensuring indicator rod lever passes through clearance hole in access panel (2) (fig.407) to seat on topside of lock yoke, depressing the indicator rod lever and extending the indicator rod.**
- (c) Refer to fig.403 (Sheet 1 or 2), fit and secure bolts (3) and (4) then bolts and washers (5) ensuring brackets (8) are correctly positioned on firewall. Secure fasteners (6).**
- (d) On engines with S.B.71-4823 fit and secure bolt and washer (12), refer to fig.403 (sheet 2).**
- (e) On engines incorporating S.B.71-2278, position bracket (2) on upper R.H. detachable firewall assembly (7) and secure with bolts and washers (1).**
- (f) On engines incorporating S.B.36-2441, fit de-activation valve (Ref. 78-31-42).**

(9) No.2 engine

- (a) Refer to fig.401, position R.H. firewall extension (5) and secure with bolts (2).**
- (b) Position cowl seal on firewall and secure with bolts (1).**

R EFFECTIVITY: RB211-22B-02/11

R

050B

1A

71-30-01
CONFIG-1
Page 425
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

- (10) No.1 and No.3 engines
 - (a) Fit R.H. hinged cowl 414A or 424A (Ref. 71-11-02).
 - (11) No.2 engine
 - (a) Fit L.H. and R.H. upper hinged cowls, 433DL and 434DR (Ref. 71-12-05).
 - (b) Fit L.H. and R.H. lower hinged cowls, 433AL and 434AR (Ref. 71-12-01).
 - (c) Fit L.H. and R.H. mid fixed cowls, 433CL and 434CR (Ref. 71-12-03).
 - (12) Unlock and reactivate thrust reverser and associated systems (Ref. 78-30-00).
- C. Remove Upper L.H. Detachable Firewall Assembly and Pressure Cylinder
- (1) Operate thrust reverser to reverse thrust position (Ref. 78-30-00).
 - (2) WARNING: ENSURE THRUST REVERSER SYSTEM IS LOCKED IN REVERSE THRUST POSITION WHILE WORK IS IN PROGRESS.
Deactivate and tag thrust reverser and associated systems and fit thrust reverser locks (Ref. 78-30-00).
 - (3) No.1 and No.3 engines
 - (a) Remove L.H. hinged cowl, 413A or 423A (Ref. 71-11-01).

R EFFECTIVITY: RB211-22B-02/11

050B

1A

71-30-01
CONFIG-1
Page 426
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

(4) No.2 engine

- (a) Remove L.H. and R.H. upper hinged cowls, 433DL and 434DR (Ref. 71-12-05).
- (b) Remove L.H. and R.H. lower hinged cowls, 433AL and 434AR (Ref. 71-12-01).
- (c) Remove L.H. and R.H. mid fixed cowls, 433CL and 434CR (Ref. 71-12-03).
- (d) Refer to fig.401, remove bolts (1) then remove cowl seal clear of firewall.
- (e) Remove bolts (2) and (3) then remove L.H. firewall extension (4).

(5) Remove Upper L.H. Detachable Firewall Assembly

- (a) Refer to fig.402 (Sheet 1 or 2), remove A.C.O.C. outlet duct (Ref. 79-21-01).
- (b) Remove bolts (1) and bolts and washers (2).
- (c) On engines with S.B.71-4823 remove bolt and washer (13), refer to fig.402 (sheet 2).
- (d) Remove bolts (3) and slacken bolts (4).
- (e) Release fasteners (5) and remove upper L.H. detachable firewall assembly (6).
- (f) If the upper L.H. detachable firewall assembly is being replaced by a new firewall assembly on engines incorporating S.B.78-3608, remove the L.H. cowl lock indicator box assembly as follows:

Refer to fig.402 (Sheet 2), remove bolts (7) and (8) then remove L.H. cowl lock indicator box assembly (9) and retain for fitment to new firewall assembly.

(6) Remove Upper L.H. Pressure Cylinder

- (a) Refer to fig.406 (Sheet 1 or 2), remove bolts and washers (1) then access panel (2).

R

EFFECTIVITY: RB211-22B-02/11

0508

1A

71-30-01
CONFIG-1
Page 427
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

- R (b) On engines without SB 78-3882, remove bolts (3) and lift-off upper L.H. pressure cylinder (4) from inner firewall (5).
- R (c) On engines with SB 78-3882, remove bolts (3), bolts and washers (6) and withdraw access panel (7), then lift off upper L.H. pressure cylinder (4) from inner firewall.
- R
- R
- R
- R (d) Fit approved blanks to all exposed apertures and connectors.

D. Install Upper L.H. Detachable Firewall Assembly and Pressure Cylinder

(1) Equipment required:

Clean, stiff-bristled brush

(2) Material required:

	British Spec./Ref.	American Spec./Ref.	OMat Item No.
Degreasing fluid (Inhibited and stabilized 1.1.1. trichloroethane)	B.S.4487 1969	Mil-T-81533	1/21
Jointing compound	PL.32	-	4/46

- (3) Ensure thrust reverser is locked and systems deactivated and tagged as detailed in operation 3.C.(2).

- (4) Remove blanks from all connectors and apertures.

- (5) **WARNING:** WHEN USING DEGREASING FLUID, ENSURE ADEQUATE VENTILATION AND AVOID SKIN CONTACT AND INHALING THE VAPOUR.

Cold liquid degrease mating faces of upper L.H. detachable firewall assembly, upper L.H. pressure cylinder, L.H. firewall extension (No.2 engine only) and inner firewall and allow to dry.

- (6) Brush apply a thin film of jointing compound to mating faces of upper L.H. detachable firewall assembly, upper L.H. pressure cylinder, L.H. firewall extension (No.2 engine only) and inner firewall. Allow compound to dry for a minimum period of 10 minutes.

EFFECTIVITY: RB211-22B-02/11

050B

1A

71-30-01
CONFIG-1
Page 428
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

(7) Install Upper L.H. Pressure Cylinder

- R (a) On engines without SB 78-3882, refer to fig.406 (Sheet 1), fit upper L.H. pressure cylinder (4) to inner firewall (5) then fit and secure bolts (3).
- R (b) On engines with SB 78-3882, refer to Fig.406 (Sheet 2), fit upper L.H. pressure cylinder (4) to inner firewall. Fit and secure access panel (7) using bolts and washers (6) and bolts (3).
- R (c) Fit and secure access panel (2) using bolts and washers (1).

(8) Install Upper L.H. Detachable Firewall Assembly

- (a) If the upper L.H. detachable firewall assembly is replaced by a new firewall assembly on engines incorporating S.B.78-3608, fit the existing L.H. cowl lock indicator box assembly as follows:

Refer to fig.402 (Sheet 2), fit the L.H. cowl lock indicator box assembly (9) to the upper L.H. detachable firewall assembly (6) then fit and secure bolts (7) and (8).

- (b) Refer to fig.402 (Sheet 1 or 2), position upper L.H. detachable firewall assembly (6) over pressure cylinder assembly, ensuring indicator rod lever passes through clearance hole in access panel (2) (fig.406 (Sheet 1 or 2) to seat on topside of lock yoke depressing the indicator rod lever and extending the indicator rod.
- (c) Refer to fig.402 (Sheet 1 or 2), fit and secure bolts (1), (3), bolts and washers (2) and fully tighten bolts (4). Secure fasteners (5).
- (d) On engines with S.B.71-4823 fit and secure bolt and washer (13), refer to fig.402 (sheet 2).
- (e) Fit A.C.O.C. outlet duct (Ref. 79-21-01).

(9) No. 2 engine

- (a) Refer to fig.401, position L.H. firewall extension (4) and secure with bolts (3) and (2).

EFFECTIVITY: RB211-22B-02/11

1A

71-30-01
CONFIG-1
Page 429
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

- (b) Position cowl seal on firewall and secure with bolts (1).
- (10) No.1 and No.3 engines
 - (a) Fit L.H. hinged cowl 413A or 423A (Ref. 71-11-01).
- (11) No.2 engine
 - (a) Fit L.H. and R.H. upper hinged cowls, 433DL and 434DR (Ref. 71-12-05).
 - (b) Fit L.H. and R.H. lower hinged cowls, 433AL and 434AR (Ref. 71-12-01).
 - (c) Fit L.H. and R.H. mid fixed cowls, 433CL and 434CR (Ref. 71-12-03).
- (12) Unlock and reactivate thrust reverser and associated systems (Ref. 78-30-00).

E. Remove Lower Fixed Firewall and Pressure Cylinder Assembly

- (1) Operate thrust reverser to reverse thrust position (Ref. 78-30-00).
- (2) WARNING: ENSURE THRUST REVERSER SYSTEM IS LOCKED IN REVERSE THRUST POSITION WHILE WORK IS IN PROGRESS.
Deactivate and tag thrust reverser and associated systems and fit thrust reverser locks (Ref. 78-30-00)
- (3) No.1 and No.3 engines
 - (a) Remove L.H. and R.H. hinged cowls 413A or 423A (Ref. 71-11-01) and 414A or 424A (Ref. 71-11-02).
- (4) No.2 engine
 - (a) Remove L.H. and R.H. upper hinged cowls, 433DL and 434DR (Ref. 71-12-05).
 - (b) Remove L.H. and R.H. lower hinged cowls, 433AL and 434AR (Ref. 71-12-01).
 - (c) Remove L.H. and R.H. mid fixed cowls, 433CL and 434CR (Ref. 71-12-03).

R EFFECTIVITY: RB211-22B-02/11
R

050B

1A

71-30-01
CONFIG-1
Page 430
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

- (d) Refer to fig.401, remove bolts (1) then remove cowl seal clear of firewall.
- (e) Remove bolts (2) and (3) then remove L.H. and R.H. firewall extensions (4) and (5).
- (5) Remove Upper L.H. Detachable Firewall Assembly
 - (a) Refer to fig.402 (Sheet 1 or 2), remove A.C.O.C. outlet duct (Ref. 79-21-01).
 - (b) Remove bolts (1) and bolts and washers (2).
 - (c) On engines with S.B.71-4823 remove bolt and washer (13), refer to fig.402 (sheet 2).
 - (d) Remove bolts (3) and slacken bolts (4).
 - (e) Release fasteners (5) and remove upper L.H. detachable firewall assembly (6).
- (6) Remove Upper R.H. Detachable Firewall Assembly
 - (a) Refer to fig.403 (Sheet 1 or 2), on engines incorporating S.B.36-2441 remove deactivation valve (Ref. 78-31-42).
 - (b) On engines incorporating S.B.71-2278, remove bolts and washers (1) and bracket (2).
 - (c) Remove bolts (3) and (4) and bolts and washers (5) noting positions of brackets (8) for assembly.
 - (d) On engines with S.B.71-4823 remove bolt and washer (13), refer to fig.403 (sheet 2).
 - (e) Release fasteners (6) and remove upper R.H. detachable firewall assembly (7).
 - (f) Remove I.D.G. oil cooler outlet duct (Ref. 24-11-08).
- (7) Remove Lower Fixed Firewall and Pressure Cylinder assembly
 - (a) Refer to fig.404 (Sheet 1 or 2), disconnect connectors (1), (2) and (3).

R EFFECTIVITY: RB211-22B-02/11

R

050B

1A

71-30-01

CONFIG-1

Page 431

Jun 15/94

RB.211 Propulsion System
MAINTENANCE

- (b) No.2 engine also disconnect connector (4).
- (c) Refer to fig.406 (Sheet 1), remove bolts and washers (1) then remove L.H. access panel (2).
- (d) Refer to fig.407, remove bolts and washers (1) then remove R.H. access panel (2).
- (e) Refer to fig.404 (Sheet 1 or 2), release fasteners (5) and remove sensor assembly (9).
- (f) Remove bolts and washers (6) noting positions of brackets (7) and (8) for assembly.
- (g) Refer to fig.408, remove lower fixed firewall and pressure cylinder assembly (1) from inner firewall (2).
- (h) Fit approved blanks to all exposed apertures and connectors.

F. Install Lower Fixed Firewall and Pressure Cylinder Assembly

(1) Equipment required

Clean, stiff-bristled brush

(2) Material required:

	British Spec./Ref.	American Spec./Ref.	OMat Item No.
Degreasing fluid (Inhibited and stabilized 1.1.1. trichloroethane)	B.S.4487 1969	Mil-T-81533	1/21
Jointing compound	PL32	-	4/46

- (3) Ensure thrust reverser is locked and systems are deactivated and tagged as detailed in operation 3.E.(2).
- (4) Remove blanks from all connectors and apertures.

R EFFECTIVITY: RB211-22B-02/11

R

0508

1A

71-30-01
 CONFIG-1
 Page 432
 Jun 15/94



RB.211 Propulsion System

MAINTENANCE

- (5) **WARNING:** WHEN USING DEGREASING FLUID, ENSURE ADEQUATE VENTILATION AND AVOID SKIN CONTACT AND INHALING THE VAPOUR.
Cold liquid degrease mating faces of upper L.H. and R.H. detachable firewall assemblies, lower pressure cylinder and firewall assembly, firewall extensions (No.2 engine only) and inner firewall and allow to dry.
- (6) Brush apply a thin film of jointing compound to mating faces of upper L.H. and R.H. detachable firewall assemblies, lower pressure cylinder and firewall assembly, firewall extensions (No.2 engine only) and inner firewall. Allow compound to dry for a minimum period of 10 minutes.
- (7) Install Lower Fixed Firewall and Pressure Cylinder Assembly
- (a) Refer to fig.408, fit lower fixed firewall and pressure cylinder assembly (1) on inner firewall (2).
 - (b) Refer to fig.404 (Sheet 1 or 2), fit and secure bolts and washers (6) ensuring brackets (7) and (8) are correctly positioned on firewall.
 - (c) Refer to fig.407, fit and secure R.H. access panel (2) using bolts and washers (1).
 - (d) Refer to fig.406 (Sheet 1), fit and secure L.H. access panel (2) using bolts and washers (1).
 - (e) Refer to fig.404 (Sheet 1 or 2), fit and lubricate (Ref. 70-02-01) new seal rings to connectors (3), (2) and (1); connect and secure connectors (3), (2) and (1).
 - (f) No.2 engine also connect and secure connector (4).
 - (g) Position sensor assembly (9) and secure with fasteners (5).
- (8) Install Upper R.H. Detachable Firewall Assembly
- (a) Refer to fig.403 (Sheet 1 or 2), fit I.D.G. cooler outlet duct (Ref. 24-11-08).

R EFFECTIVITY: RB211-22B-02/11
R

0508

1A

71-30-01
CONFIG-1
Page 433
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

- (b) Position upper R.H. detachable firewall assembly (7) over pressure cylinder assembly ensuring indicator rod lever passes through clearance hole in access panel (2) (fig.407) to seat on topside of lock yoke, depressing the indicator rod lever and extending the indicator rod.
 - (c) On engines with S.B.71-4823 fit and secure bolt and washer (13), refer to fig.403 (sheet 2).
 - (d) Refer to fig.403 (Sheet 1 or 2), fit and secure bolts (3) and (4) and bolts and washers (5) ensuring brackets (8) are correctly positioned on firewall. Secure fasteners (6).
 - (e) On engines incorporating S.B.71-2278, position bracket (2) on upper R.H. detachable firewall assembly and secure with bolts and washers (1).
 - (f) On engines incorporating S.B.36-2441, fit deactivation valve (Ref. 78-31-42).
- (9) Install Upper L.H. Detachable Firewall Assembly
- (a) Refer to fig.402 (Sheet 1 or 2), position upper L.H. detachable firewall assembly (6) over pressure cylinder, ensuring indicator rod lever passes through clearance hole in access panel (2) fig.406 (Sheet 1 or 2) to seat on topside of lock yoke, depressing the indicator rod lever and extending the indicator rod.
 - (b) Refer to fig.402 (Sheet 1 or 2), fit and secure bolts (1), (3), bolts and washers (2) and fully tighten bolts (4). Secure fasteners (5).
 - (c) On engines with S.B.71-4823 fit and secure bolt and washer (13), refer to fig.403 (sheet 2).
 - (d) Fit A.C.O.C. outlet duct (Ref. 79-21-01).
- (10) No.2 engine
- (a) Refer to fig.401, position L.H. and R.H. firewall extensions (4) and (5) then secure with bolts (3) and (2).
 - (b) Position cowl seal on firewall and secure with bolts (1).

R EFFECTIVITY: RB211-22B-02/11

R

050B

1A

71-30-01

CONFIG-1

Page 434

Jun 15/94



RB.211 Propulsion System

MAINTENANCE

- (11) No.1 and No.3 engines
 - (a) Fit L.H. and R.H. hinged cowls, 413A or 423A (Ref. 71-11-01) and 414A or 424A (Ref. 71-11-02).
 - (12) No.2 engine
 - (a) Fit L.H. and R.H. upper hinged cowls, 433DL and 434DR (Ref. 71-12-05).
 - (b) Fit L.H. and R.H. lower hinged cowls, 433AL and 434AR (Ref. 71-12-01).
 - (c) Fit L.H. and R.H. mid mixed cowls, 433CL and 434CR (Ref. 71-12-03).
 - (13) Unlock and reactivate thrust reverser and associated systems (Ref. 78-30-00).
- G. Remove Upper L.H. Detachable Firewall Assembly and Pressure Cylinder Access Panels on Engines Incorporating S.B.78-3882
- (1) Operate thrust reverser to reverse thrust position (Ref.78-30-00).
 - (2) **WARNING:** ENSURE THRUST REVERSER SYSTEM IS LOCKED IN REVERSER THRUST POSITION WHILE WORK IS IN PROGRESS.
Deactivate and tag thrust reverser and associated systems and fit thrust reverser locks (Ref.78-30-00).
 - (3) No.1 and No.3 engines
 - (a) Remove L.H. hinged cowl, 413A or 423A (Ref.71-11-01).
 - (4) No.2 engine
 - (a) Remove L.H. upper hinged cowl, 433DL (Ref.71-12-05).
 - (b) Refer to fig.401, remove top three of bolts (1), remove bolts (2) and (3) then remove L.H. firewall extension (4).
- NOTE:** If there is insufficient clearance to remove L.H. firewall extension (4), remove more of bolts (1) until sufficient clearance is obtained.

R EFFECTIVITY: RB211-22B-02/11

R

050B

1A

71-30-01
CONFIG-1
Page 435
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

(5) Remove Upper L.H. Detachable Firewall Assembly Access Panel

- (a) Refer to fig.402 (Sheet 2), remove top five of bolts and washers (2), remove bolts (3), slacken bolts (4) and remove bolts (10) and (11). Remove access panel (12).

(6) Remove Upper L.H. Pressure Cylinder Access Panel

- (a) Remove bolts (3) and bolts and washers (6), then withdraw access panel (7), refer to fig.406 (sheet 2).
- (b) On engines with S.B.71-4823, remove bolts (3) and bolts and washers (6), then withdraw access panel (7A).
- (c) If access panel (7A) is to be replaced by a new access panel, remove sealing bracket as follows:
- Remove bolts (8) and retain sealing bracket for fitment to new access panel, refer to fig.406 (sheet 2).

(7) Fit approved blanks to all exposed apertures and connectors.

H. Install Upper L.H. Detachable Firewall Assembly and Pressure Cylinder Access Panels on Engines Incorporating S.B.78-3882

(1) Equipment required:

Clean, stiff-bristled brush

(2) Material required:

	British Spec./Ref.	American Spec./Ref.	OMat Item No.
Degreasing fluid (Inhibited and stabilized 1.1.1. trichloroethane)	BS4487 1969	Mil-T-81533	1/21
Jointing compound	PL.32	-	4/46

R EFFECTIVITY: RB211-22B-02/11

R

050B

1A

71-30-01
CONFIG-1
Page 436
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

- (3) Ensure thrust reverser is locked and systems deactivated and tagged as detailed in operation 3.G.(2).
- (4) Remove blanks from all apertures and connectors.
- (5) **WARNING:** WHEN USING DEGREASING FLUID, ENSURE ADEQUATE VENTILATION AND AVOID SKIN CONTACT AND INHALING VAPOUR.
Cold liquid degrease mating faces of upper L.H. detachable firewall assembly access panel, upper L.H. pressure cylinder access panel, L.H. firewall extension (No.2 engine only) and inner firewall and allow to dry.
- (6) Brush apply a thin film of jointing compound to mating faces of upper L.H. detachable firewall assembly access panel, upper L.H. pressure cylinder access panel, L.H. firewall extension (No.2 engine only) and inner firewall. Allow compound to dry for a minimum period of 10 minutes.
- (7) Install Upper L.H. Pressure Cylinder Access Panel
 - (a) If upper L.H. pressure cylinder access panel (7A) is being replaced by a new access panel on engines with S.B.71-4823, fit upper L.H. pressure cylinder sealing bracket to new access panel as follows:

Fit sealing bracket to access panel and secure with bolts and washers (8), refer to fig.406 (sheet 2)
 - (b) Fit access panel (7) or (7A) to upper L.H. pressure cylinder (4) and secure with bolts (3) and bolts and washers (6).
- (8) Install Upper L.H. Detachable Firewall Assembly Access Panel.
 - (a) Refer to fig.402 (Sheet 2), fit access panel (12) to upper L.H. detachable firewall assembly (6) then fit and secure top five of bolts and washers (2) and bolts (3); fully tighten bolts (4) and fit and secure bolts (10) and (11).

R EFFECTIVITY: RB211-22B-02/11

R

050B

1A

71-30-01
CONFIG-1
Page 437
Jun 15/94

RB.211 Propulsion System
MAINTENANCE

- (9) No.2 engine
 - (a) Refer to fig.401, position L.H. firewall extension (4) and secure with bolts (2) and (3). Fit and secure bolts (1).
- (10) No.1 and No.3 engines
 - (a) Fit L.H. hinged cowl, 413A or 423A (Ref.71-11-01).
- (11) No.2 engine
 - (a) Fit L.H. upper hinged cowl, 433DL (Ref.71-12-05).
- (12) Unlock and reactivate thrust reverser and associated systems.

R EFFECTIVITY: RB211-22B-02/11
R

050B

1A

71-30-01
CONFIG-1
Page 438
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

ENGINE FIREWALL - REMOVAL/INSTALLATION

1. Remove Firewall and Pressure Cylinder Assembly on engines not incorporating S.B.78-3875

In the event of a thrust reverser system failure that prevents thrust reverser operation to reverse thrust position or the translating cowl being manually cycled rearwards, carry out manual traversing procedure (Ref. 78-31-07).

CAUTION: THE WEIGHT OF EACH DETACHABLE FIREWALL ASSEMBLY IS APPROXIMATELY 11LB. (5 KG.). THE WEIGHT OF THE PRESSURE CYLINDER AND FIREWALL ASSEMBLY IS APPROXIMATELY 26 LB. (12 KG.).

Service Bulletins referred to:

- S.B.36-2441 - Introduction of Thrust Reverser De-activating Valve.
- S.B.71-2278 - Introduction of De-activating Valve Mounting Bracket.
- S.B.71-2662 - L.D. Harness and A.I.D.S. Loom Re-routed to Clear Feedback Linkage.
- S.B.71-2831 - Introduction of Tell-tale Drains System.
- S.B.73-2232 - Introduction of Self-consuming Drains System.
- S.B.78-3608 - Introduction of Detachable Cowl Lock Indicator Housings.
- S.B.78-3875 - Introduction of Engine Firewall - Pressure Cylinder with Removable Sections.
- S.B.78-3882 - Detachable Firewall and Pressure Cylinder with Removable Sections Giving Access to Feedback Gearbox.



RB.211 Propulsion System

MAINTENANCE

Referenced Procedures:

24-11-08	Oil Cooler - Removal/Installation.
70-02-01	Identification, Lubrication and Fitting of Rubber Sealing Rings.
71-11-01	L.H. Hinged Cowl - Removal/Installation.
71-11-02	R.H. Hinged Cowl - Removal/Installation.
71-12-01	L.H. and R.H. Lower Hinged Cowl - Removal/Installation.
71-12-03	L.H. and R.H. Mid Fixed Cowls - Removal/Installation.
71-12-05	L.H. and R.H. Upper Hinged Cowl - Removal/Installation.
78-30-00	Thrust Reverser - Servicing.
78-31-07	Translating Cowl - Maintenance Practices.
78-31-42	Thrust Reverser De-activation Valve - Maintenance Practices.
79-21-01	Air-cooled Oil Cooler - Maintenance Practices.

Illustrated Parts Catalogue References:

The I.P.C. sections where parts disturbed during the following operations can be located are as follows:

26-11-02	Fire Detection System - Ejector Sensor Assembly.
71-00-00	Centre Engine Cowl Seal Assembly.
71-30-01	Engine Firewall.
71-30-02	No.2 Engine Firewall Extension.
71-70-02	Engine Drain Tubes and Fittings.
71-70-03	Power Plant Drain Tubes and Fittings.

- A. Operate thrust reverser to reverse thrust position (Ref. 78-30-00).
- B. **WARNING:** ENSURE THRUST REVERSER SYSTEM IS LOCKED IN REVERSE THRUST POSITION WHILE WORK IS IN PROGRESS.
Deactivate and tag thrust reverser and associated systems and fit thrust reverser locks (Ref. 78-30-00).
- C. No.1 and No.3 engines
- (1) Remove L.H. and R.H. hinged cowls, 413A or 423A (Ref. 71-11-01) and 414A or 424A (Ref. 71-11-02).



RB.211 Propulsion System

MAINTENANCE

D. No.2 engine

- (1) Remove L.H. and R.H. upper hinged cowls, 433DL and 434DR (Ref. 71-12-05).
- (2) Remove L.H. and R.H. lower hinged cowls, 433AL and 434AR (Ref. 71-12-01).
- (3) Remove L.H. and R.H. mid fixed cowls, 433CL and 434CR (Ref. 71-12-03).

E. No.2 engine

- (1) Refer to fig.401, remove bolts (1) then move cowl seal clear of firewall.
- (2) Remove bolts (2) and (3) then withdraw L.H. and R.H. firewall extensions (4) and (5).

F. Remove Upper L.H. Detachable Firewall Assembly

- (1) Refer to fig.402 (Sheet 1 or 2), remove A.C.O.C. outlet duct (Ref. 79-21-01).
- (2) Remove bolts (1) and bolts and washers (2).
- (3) Remove bolts (3) and slacken bolts (4).
- (4) Release fasteners (5) and withdraw upper L.H. detachable firewall assembly (6).
- (5) If the upper L.H. detachable firewall assembly is being replaced by a new firewall assembly on engines incorporating S.B.78-3608, remove the L.H. cowl lock indicator box assembly as detailed in operation 3.C.(5)(f) and retain for fitment to new firewall assembly.

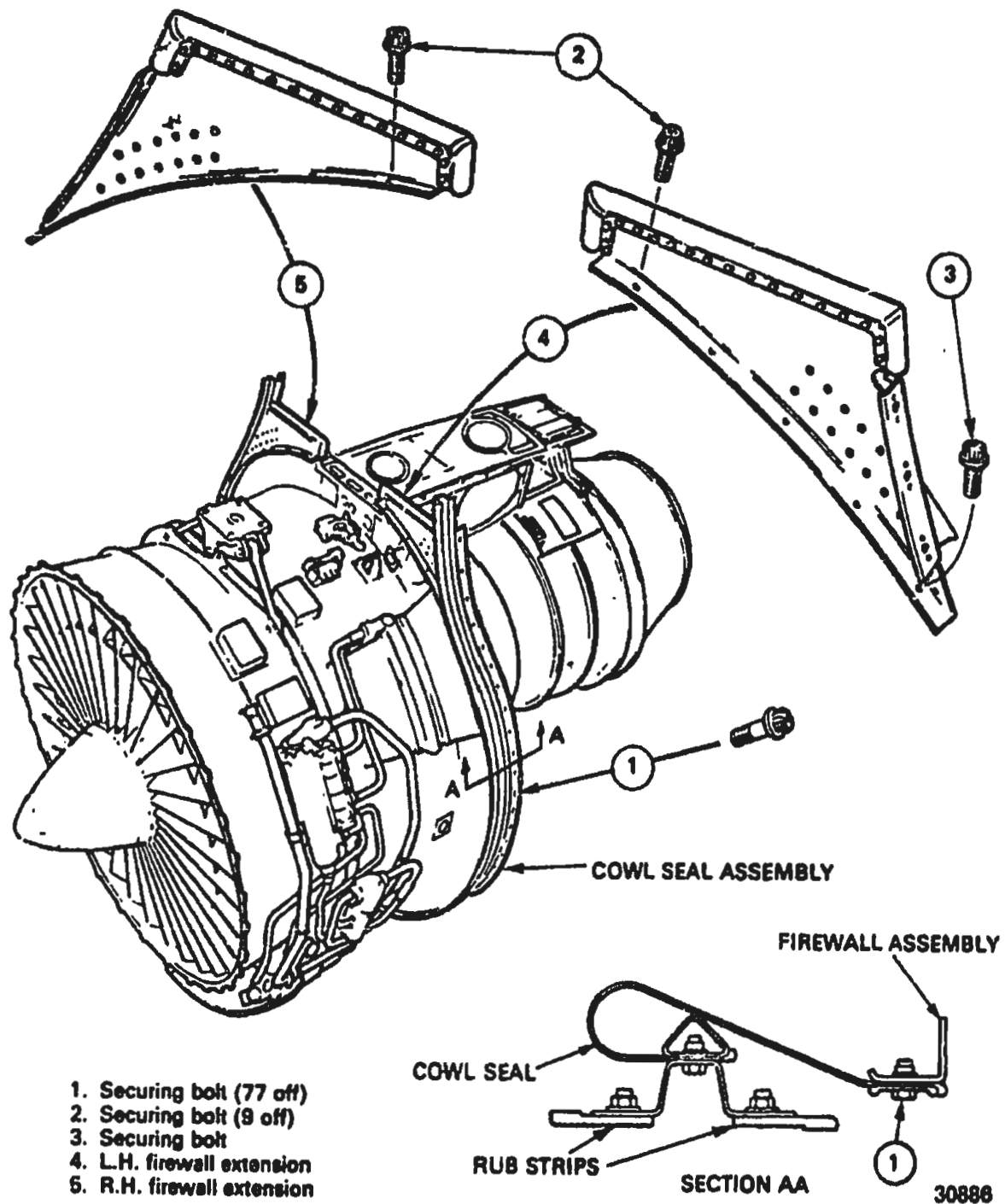
G. Remove Upper R.H. Detachable Firewall Assembly

- (1) Refer to fig.403 (Sheet 1 or 2), on engines incorporating S.B.36-2441 remove de-activation valve (Ref. 78-31-42).



RB.211 Propulsion System

MAINTENANCE



No.2 engine firewall extension and cowl seal - Removal/Installation
Fig.401

R EFFECTIVITY: RB211-22B-02/10

0508

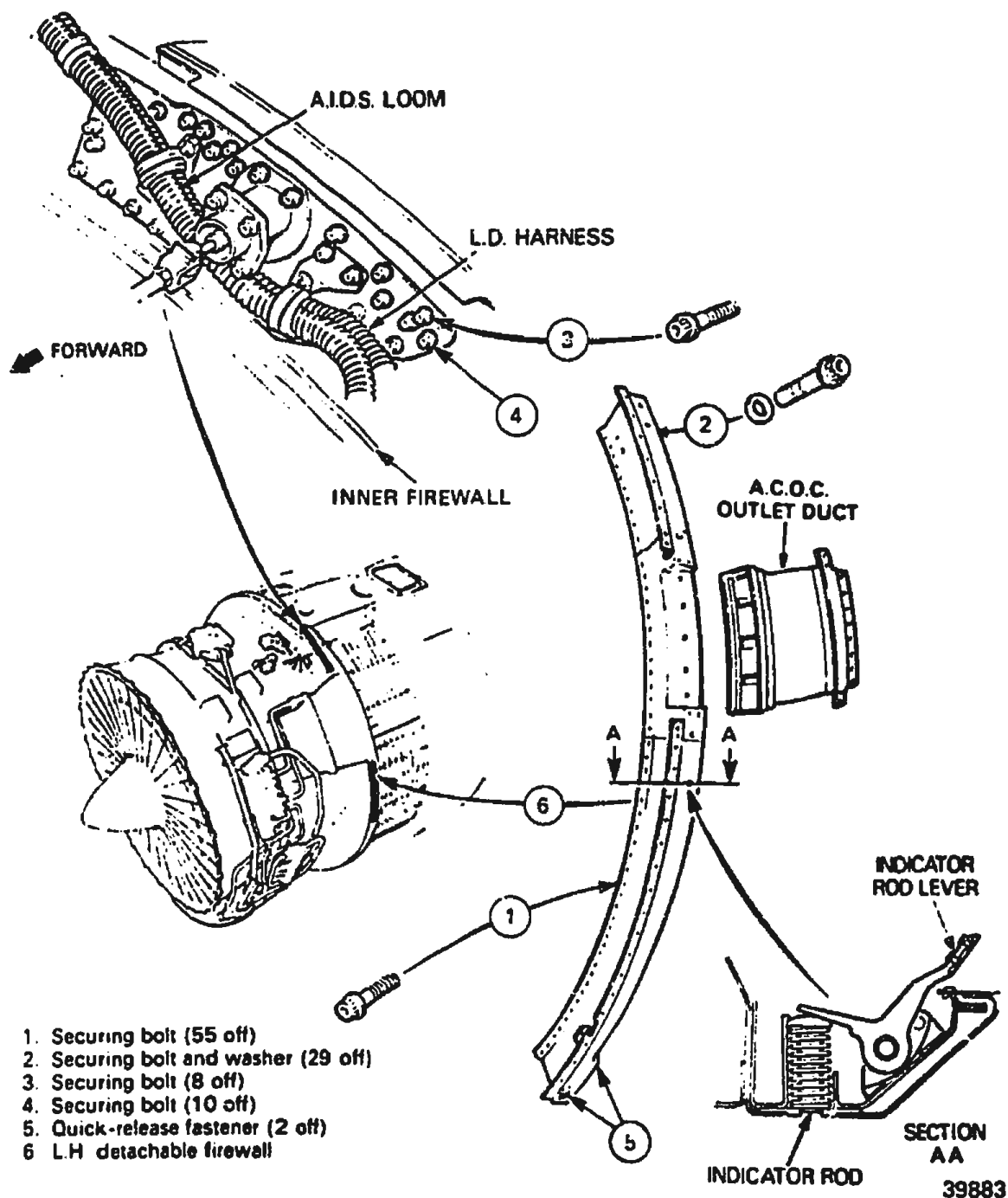
1A

71-30-01
CONFIG-2
Page 404
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



Upper L.H. detachable firewall assembly - Removal/Installation
(Pre S.B.71-2662, S.B.78-3608 and S.B.78-3882)
Fig.402 (Sheet 1)

0508 EFFECTIVITY: RB211-22B-02/10

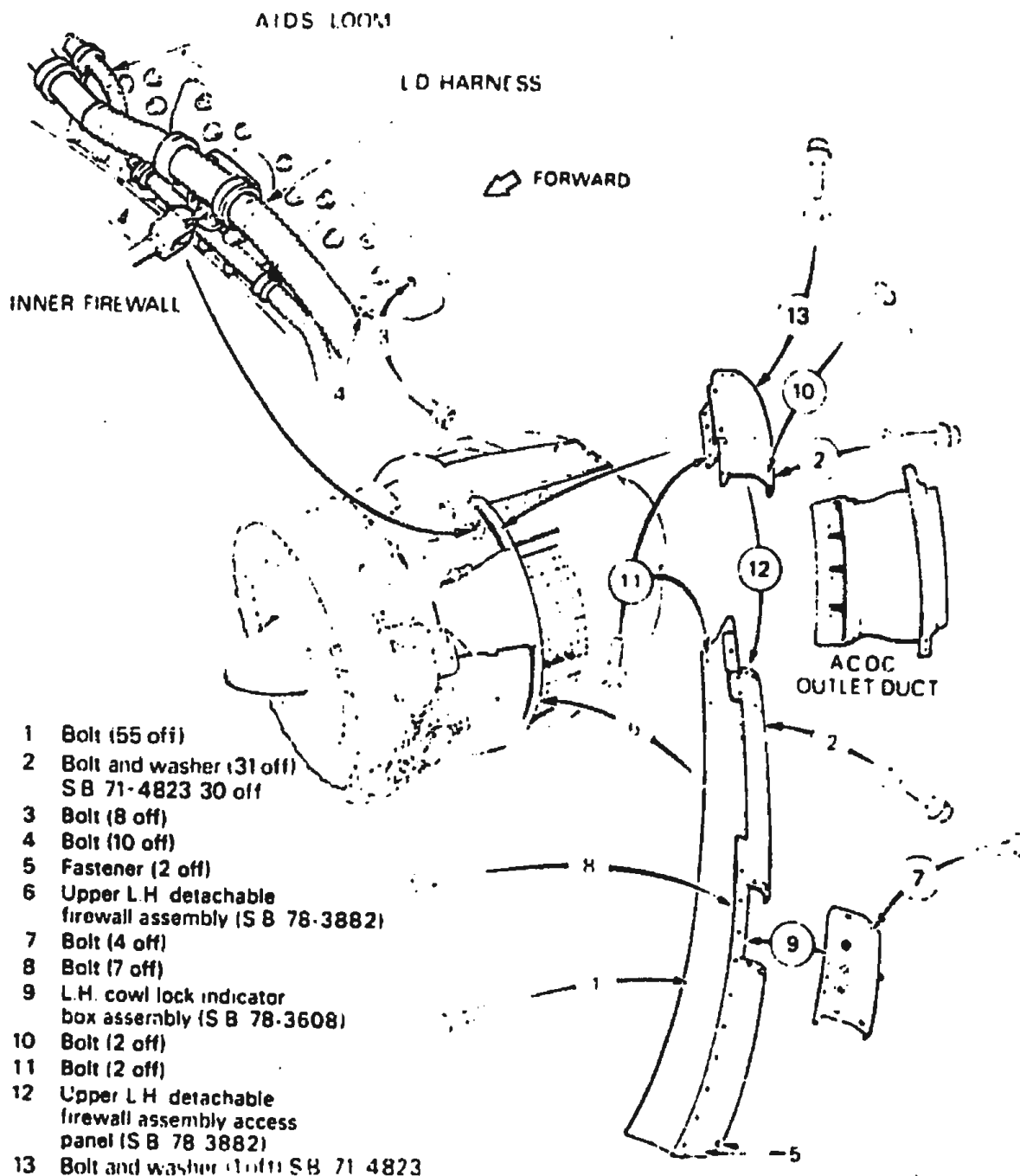
2A

71-30-01
CONFIG-2
Page 405
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



39884A

Upper L.H. detachable firewall assembly - Removal/Installation
(S.B.71-2662, S.B.78-3608, S.B.78-3882 and S.B.71-4823)
Fig.402 (Sheet 2)

R EFFECTIVITY: RB211-22B-02/10

0508

2A

71-30-01
CONFIG-2
Page 406
Nov 15/81



RB.211 Propulsion System

MAINTENANCE

- (2) On engines incorporating S.B.71-2278, remove bolts and washers (1) and bracket (2).
- (3) Remove bolts (3) and (4) and bolts and washers (5) noting positions of brackets (8) and (9) for assembly.
- (4) Release fasteners (6) and withdraw upper R.H. detachable firewall assembly (7).
- (5) If the upper R.H. detachable firewall assembly is being replaced by a new firewall assembly on engines incorporating S.B.78-3608, remove the R.H. cowl lock indicator box assembly as detailed in operation 3.A.(5)(f) and retain for fitment to new firewall assembly.

H. Remove Lower Fixed Firewall and Pressure Cylinder Assembly

- (1) Refer to fig.403 (Sheet 1 or 2), remove I.D.G. oil cooler outlet duct (Ref.24-11-08).
- (2) Refer to fig.404 (Sheet 1 or 2), disconnect connectors (1), (2) and (3).
- (3) No.2 engine, disconnect connector (4).
- (4) Release fasteners (5) and remove sensor assembly (11).
- (5) Remove bolts and washers (6) noting positions of brackets (7), (8), (9) and (10) for assembly.
- (6) Refer to fig.405, remove bolts and washers (1). Spring pressure cylinder and firewall assembly (2) outward to clear hoop plate and slide rearward to expose inner firewall (3).
- (7) Fit approved blanks to all exposed apertures and connectors.

2. Install Firewall and Pressure Cylinder Assembly on engines not incorporating S.B.78-3875

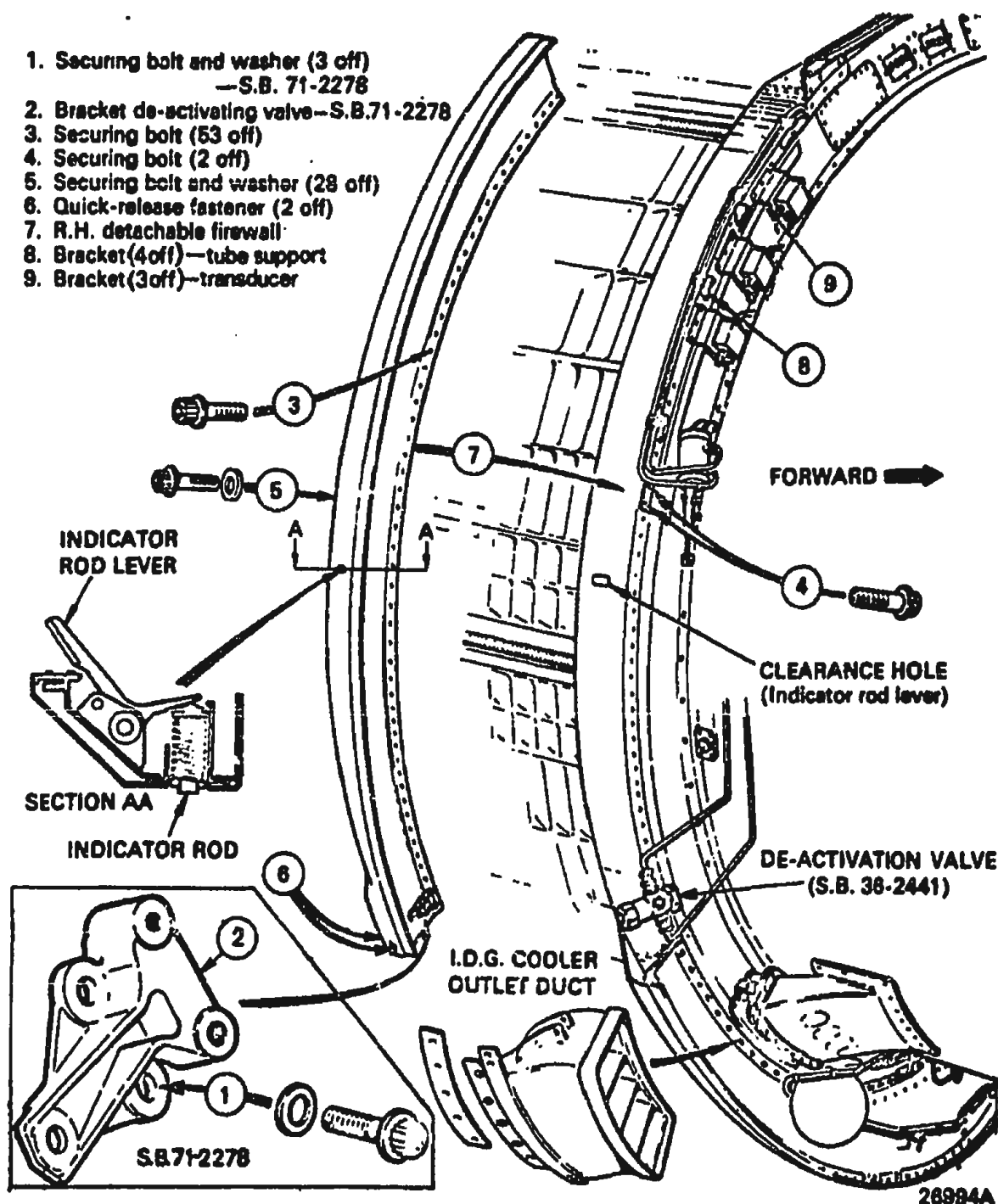
A. Equipment required:

Clean, stiff-bristled brush



RB.211 Propulsion System

MAINTENANCE



Upper R.H. detachable firewall assembly - Removal/Installation
(Pre S.B. 78-3608)
Fig. 403 (Sheet 1)

R EFFECTIVITY: RB211-22B-02/10

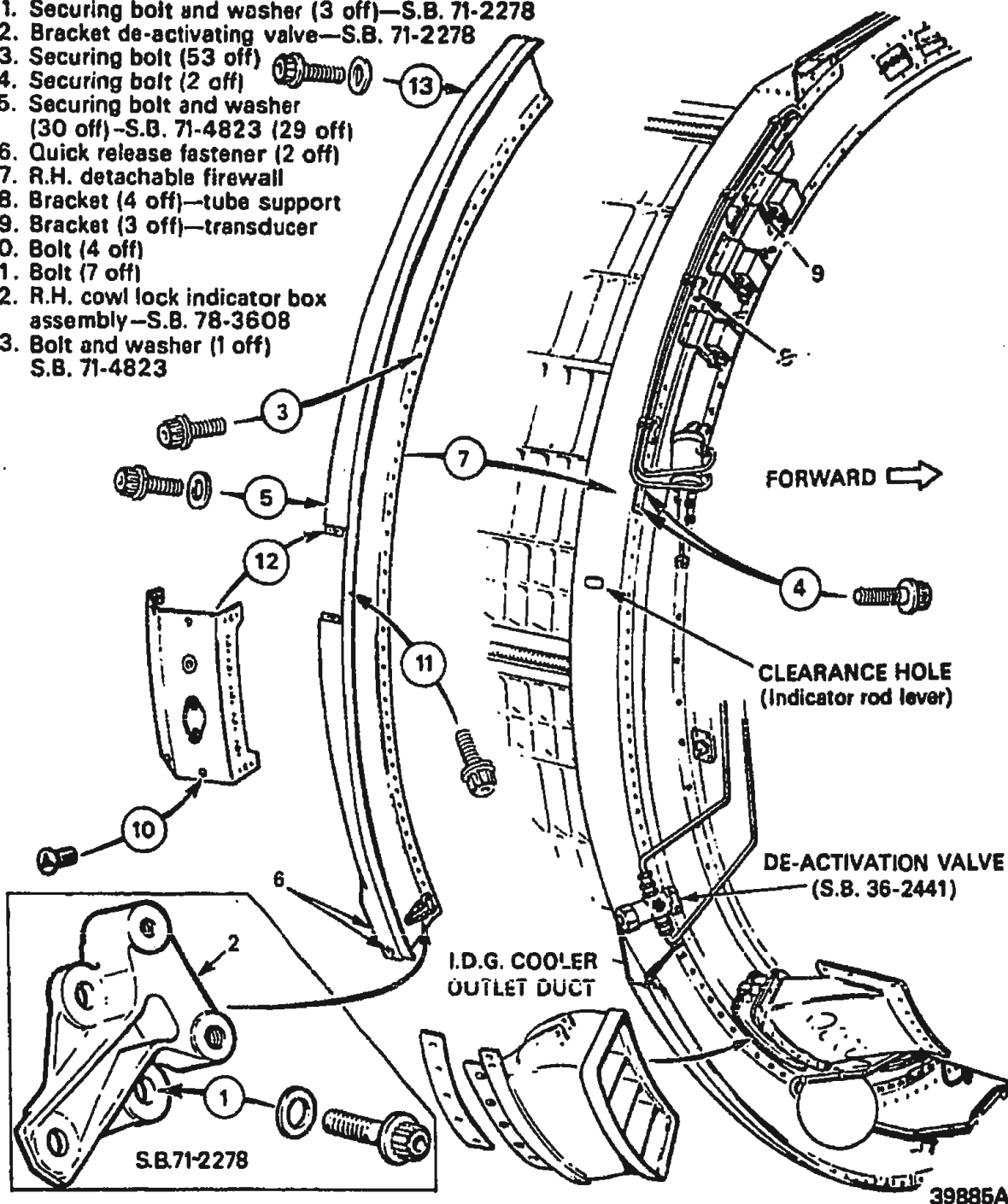
050B

2A

71-30-01
CONFIG-2
Page 408
Nov 15/81

RB.211 Propulsion System **MAINTENANCE**

1. Securing bolt and washer (3 off)—S.B. 71-2278
2. Bracket de-activating valve—S.B. 71-2278
3. Securing bolt (53 off)
4. Securing bolt (2 off)
5. Securing bolt and washer (30 off)—S.B. 71-4823 (29 off)
6. Quick release fastener (2 off)
7. R.H. detachable firewall
8. Bracket (4 off)—tube support
9. Bracket (3 off)—transducer
10. Bolt (4 off)
11. Bolt (7 off)
12. R.H. cowl lock indicator box assembly—S.B. 78-3608
13. Bolt and washer (1 off) S.B. 71-4823



Upper R.H. detachable firewall assembly - Removal/Installation
 (S.B. 78-3608 and S.B. 4823)
 Fig. 403 (Sheet 2)

2

R EFFECTIVITY: RB211-22B-02/10

0508

2A

71-30-01
 CONFIG-2
 Page 409
 Nov 15/81

RB.211 Propulsion System
MAINTENANCE

B. Material required:

	British Spec./Ref.	American Spec./Ref.	OMat Item No.
Degreasing fluid (Inhibited and stabilized 1.1.1. trichloroethane)	B.S.4487: 1969	Mil-T-81533	1/21
Jointing compound	PL.32	-	4/46

C. Ensure thrust reverser is locked and systems are deactivated and tagged as detailed in operation 1.B.

D. Remove blanks from all apertures and connectors.

E. **WARNING:** WHEN USING DEGREASING FLUID, ENSURE ADEQUATE VENTILATION AND AVOID SKIN CONTACT AND INHALING THE VAPOUR.

Cold liquid degrease mating faces of upper L.H. and R.H. detachable firewall assembly, pressure cylinder and firewall assembly, firewall extensions (No.2 engine only) and inner firewall and allow to dry.

F. Brush apply a thin film of jointing compound to mating faces of upper L.H. and R.H. detachable firewall assemblies, pressure cylinder and firewall assembly, firewall extensions (No.2 engine only) and inner firewall. Allow compound to dry for a minimum period of 10 minutes.

G. Install Lower Fixed Firewall and Pressure Cylinder Assembly

(1) Refer to fig.405, slide pressure cylinder and firewall assembly (2) forward and position on inner firewall (3) with upper edges located under firewall upper segment; fit and secure bolts and washers (1).

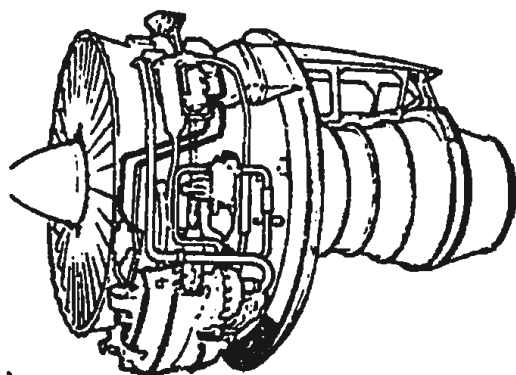
(2) Refer to fig.404 (Sheet 1 or 2), fit and secure bolts and washers (6) ensuring brackets (7), (8), (9) and (10) are correctly positioned on firewall.

(3) Fit and lubricate (Ref.70-02-01) new seal rings to connectors (3), (2) and (1); connect and secure connectors (3), (2) and (1).

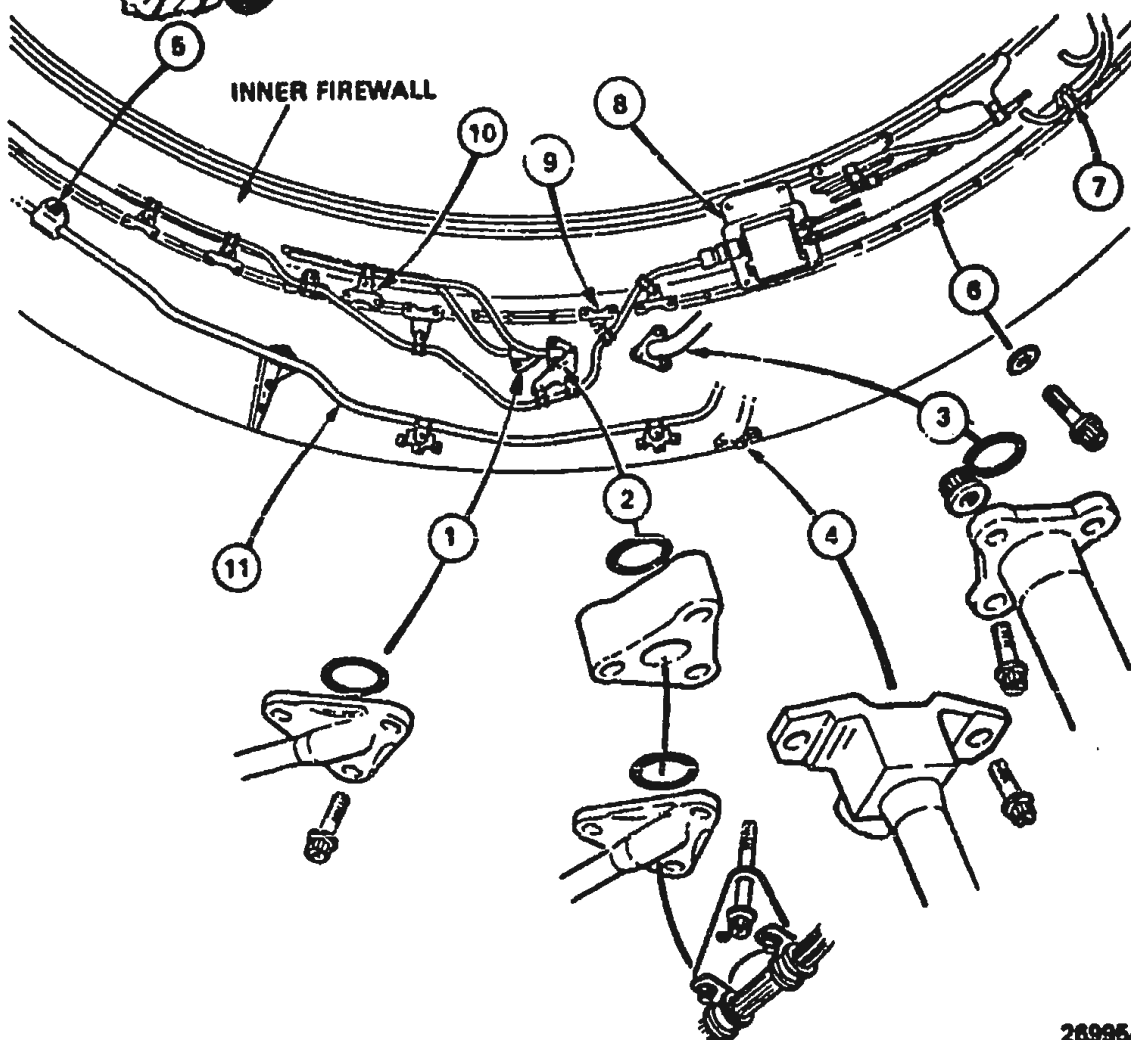


RB.211 Propulsion System

MAINTENANCE



1. Connector—fuel drains tube
2. Connector—oil drains tube
3. Connector—zone 2 vent tube
4. Connector—oil drains sump tube (No. 2 engine)
5. Quick-release fastener (4 off)
6. Securing bolt and washer (52 off)
7. Bracket—harness
8. Bracket—transducer
9. Bracket—transducer harness (8 off)
10. Bracket—drain tubes support
11. Sensor assembly



28995A

Pressure cylinder and firewall assembly lower
disconnect points - Pre S.B.73-2232 and Pre S.B.71-2831
Fig.404 (Sheet 1)

050B R EFFECTIVITY: RB211-22B-02/10

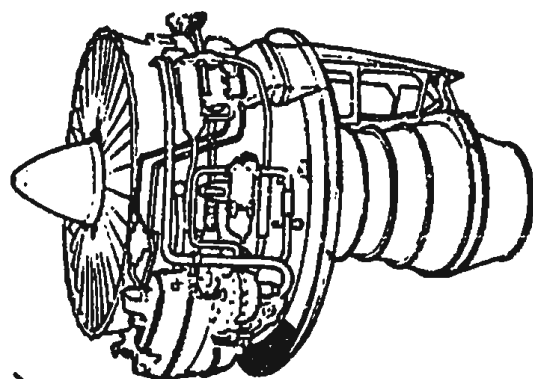
2A

71-30-01
CONFIG-2
Page 411
Nov 15/81

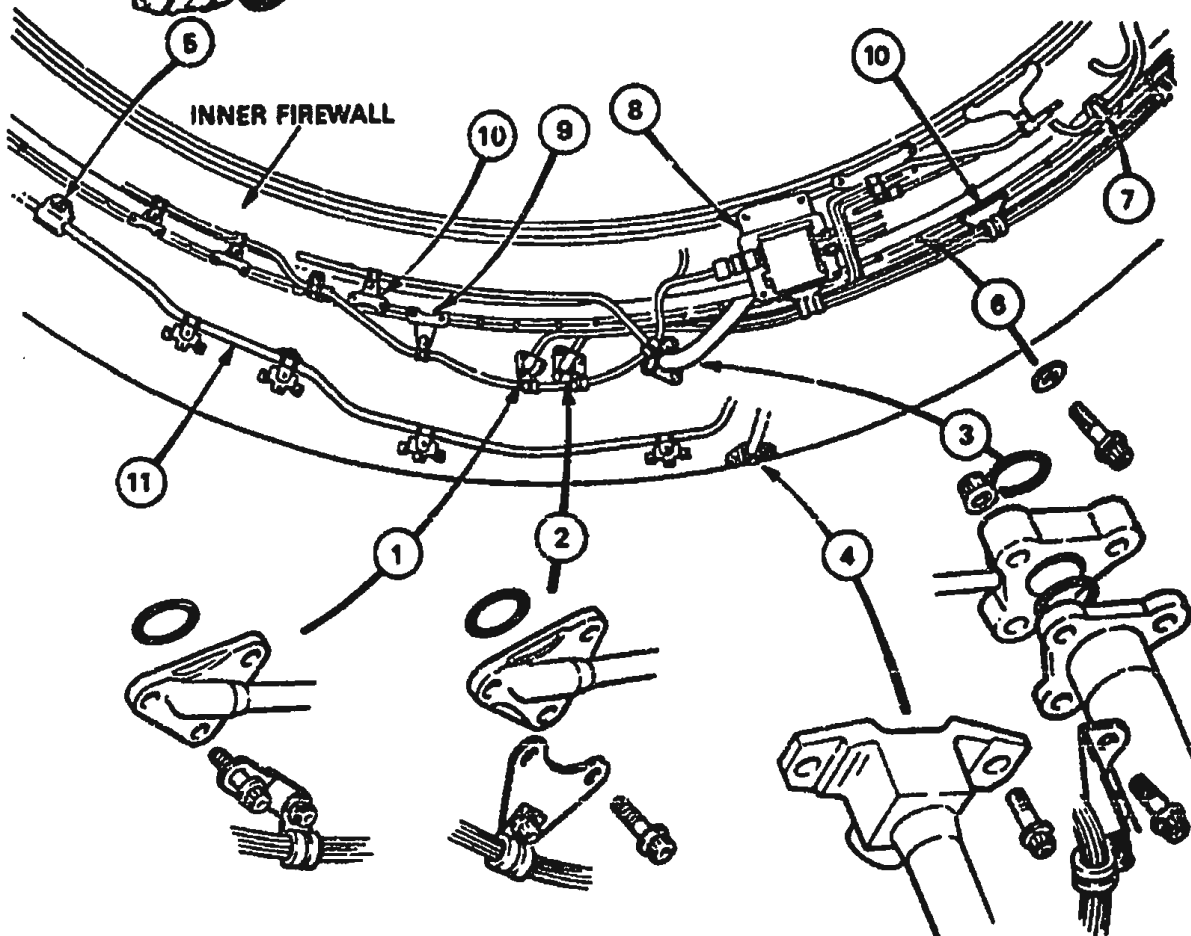


RB.211 Propulsion System

MAINTENANCE



1. Connector—fuel drains tube
2. Connector—oil drains tube
3. Connector—zone 2 vent tube
4. Connector—oil drains sump tube (No. 2 engine)
5. Quick-release fastener (4 off)
6. Securing bolt and washer (52 off)
7. Bracket—harness
8. Bracket—transducer
9. Bracket—transducer harness (4 off)
10. Bracket—drain tubes support (3 off)
11. Sensor assembly



30916

Pressure cylinder and firewall assembly lower
disconnect points - S.B.73-2232 and S.B.71-2831
Fig.404 (Sheet 2)

R EFFECTIVITY: RB211-22B-02/10
R
050B

2A

71-30-01
CONFIG-2
Page 412
Nov 15/81

RB.211 Propulsion System
MAINTENANCE

- (4) No.2 engine, connect and secure connector (4).
- (5) Refer to fig.403 (Sheet 1 or 2), fit I.D.G. oil cooler outlet duct (Ref.24-11-08).
- (6) Refer to fig.404 (Sheet 1 or 2), position sensor assembly (11) and secure with fasteners (5).

H. Install Upper R.H. Detachable Firewall Assembly

- (1) If the upper R.H. detachable firewall assembly is replaced by a new firewall assembly on engines incorporating S.B.78-3608, fit the existing R.H. cowl lock indicator box assembly to the new firewall assembly as detailed in operation 3.B.(8)(a).
- (2) Refer to fig.403 (Sheet 1 or 2), position upper R.H. detachable firewall assembly (7) over pressure cylinder and firewall assembly (fig.405, item 2), ensuring indicator rod lever passes through clearance hole in pressure cylinder to seat on topside of lock yoke, depressing the indicator rod lever and extending the indicator rod.
- (3) Fit and secure bolts (3) and (4) and bolts and washers (5) ensuring brackets (8) and (9) are correctly positioned on firewall. Secure fasteners (6).
- (4) On engines incorporating S.B.71-2278, position bracket (2) on upper R.H. detachable firewall assembly (7) and secure with bolts and washers (1).
- (5) On engines incorporating S.B.36-2441, fit de-activation valve (Ref.78-31-42).

J. Install Upper L.H. Detachable Firewall Assembly

- (1) If the upper L.H. detachable firewall assembly is replaced by a new firewall assembly on engines incorporating S.B.78-3608, fit the existing L.H. cowl lock indicator box assembly to the new firewall assembly as detailed in operation 3.D.(8)(a).

RB.211 Propulsion System
MAINTENANCE

- (2) Refer to fig.402 (Sheet 1 or 2), position upper L.H. detachable firewall assembly (6) over pressure cylinder and firewall assembly (fig.405, item 2), ensuring indicator rod lever passes through clearance hole in pressure cylinder to seat on topside of lock yoke, depressing the indicator rod lever and extending the indicator rod.
- (3) Fit and secure bolts (1) and (3), bolts and washers (2) and fully tighten bolts (4). Secure fasteners (5).
- (4) Fit A.C.O.C. outlet duct (Ref.79-21-01).

K. No.2 engine

- (1) Refer to fig.401, position L.H. and R.H. firewall extensions (4) and (5) and secure with bolts (3) and (2).
- (2) Position cowl seal on firewall and secure with bolts (1).

L. No.1 and No.3 engines

- (1) Fit L.H. and R.H. hinged cowl, 413A or 423A (Ref.71-11-01) and 414A or 424A (Ref.71-11-02).

M. No.2 engine

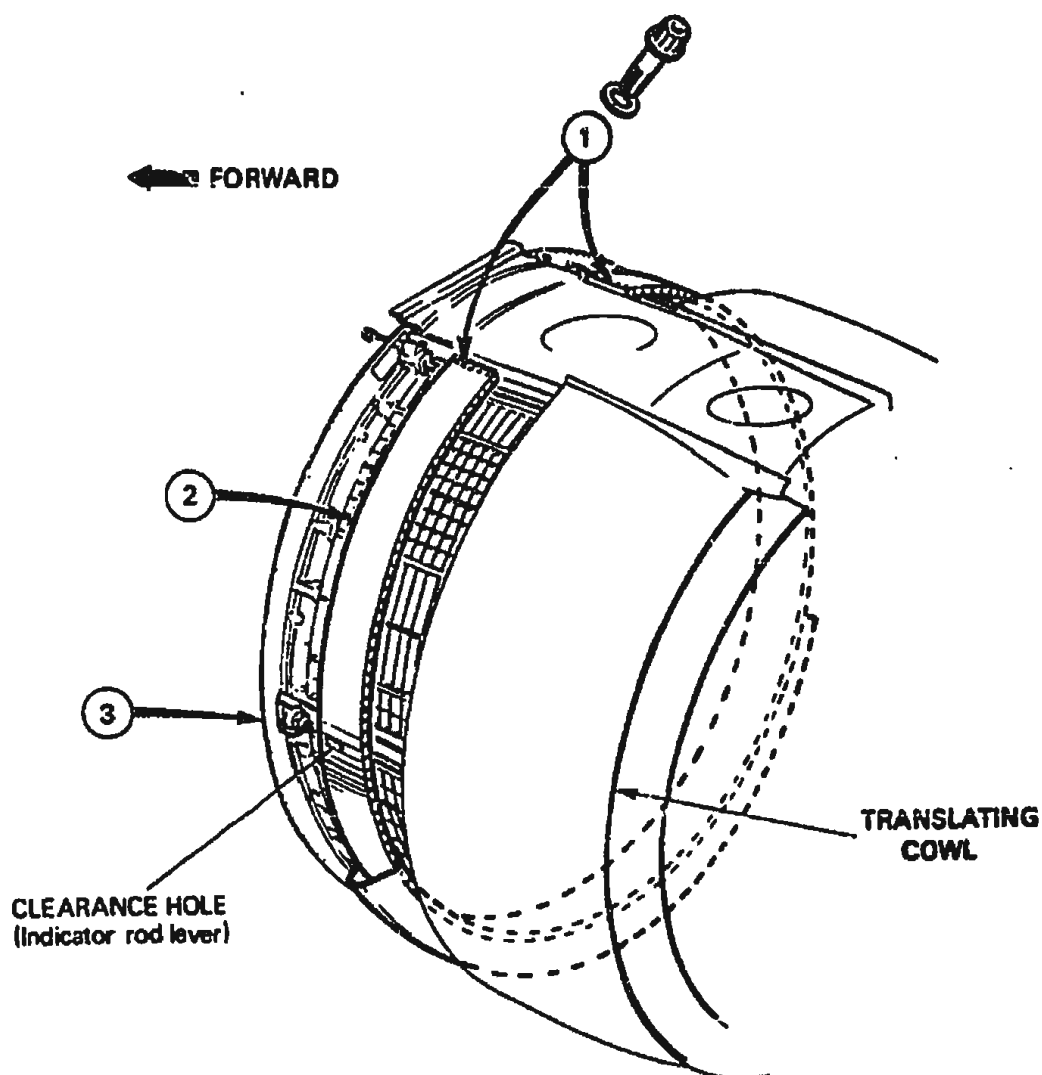
- (1) Fit L.H. and R.H. upper hinged cowl, 433DL and 434DR (Ref.71-12-05).
- (2) Fit L.H. and R.H. lower hinged cowls, 433AL and 434AR (Ref.71-12-01).
- (3) Fit L.H. and R.H. mid fixed cowls, 433CL and 434CR (Ref.71-12-03).

N. Unlock and reactivate thrust reverser and associated systems (Ref.78-30-00).



RB.211 Propulsion System

MAINTENANCE



1. Securing bolt and washer (10 off)
2. Pressure cylinder and fixed firewall assembly
3. Inner firewall

23446D

Lower fixed firewall and pressure cylinder assembly -
Removal/Installation (Pre S.B.78-3875)
Fig.405

050B EFFECTIVITY: RB211-22B-02/10

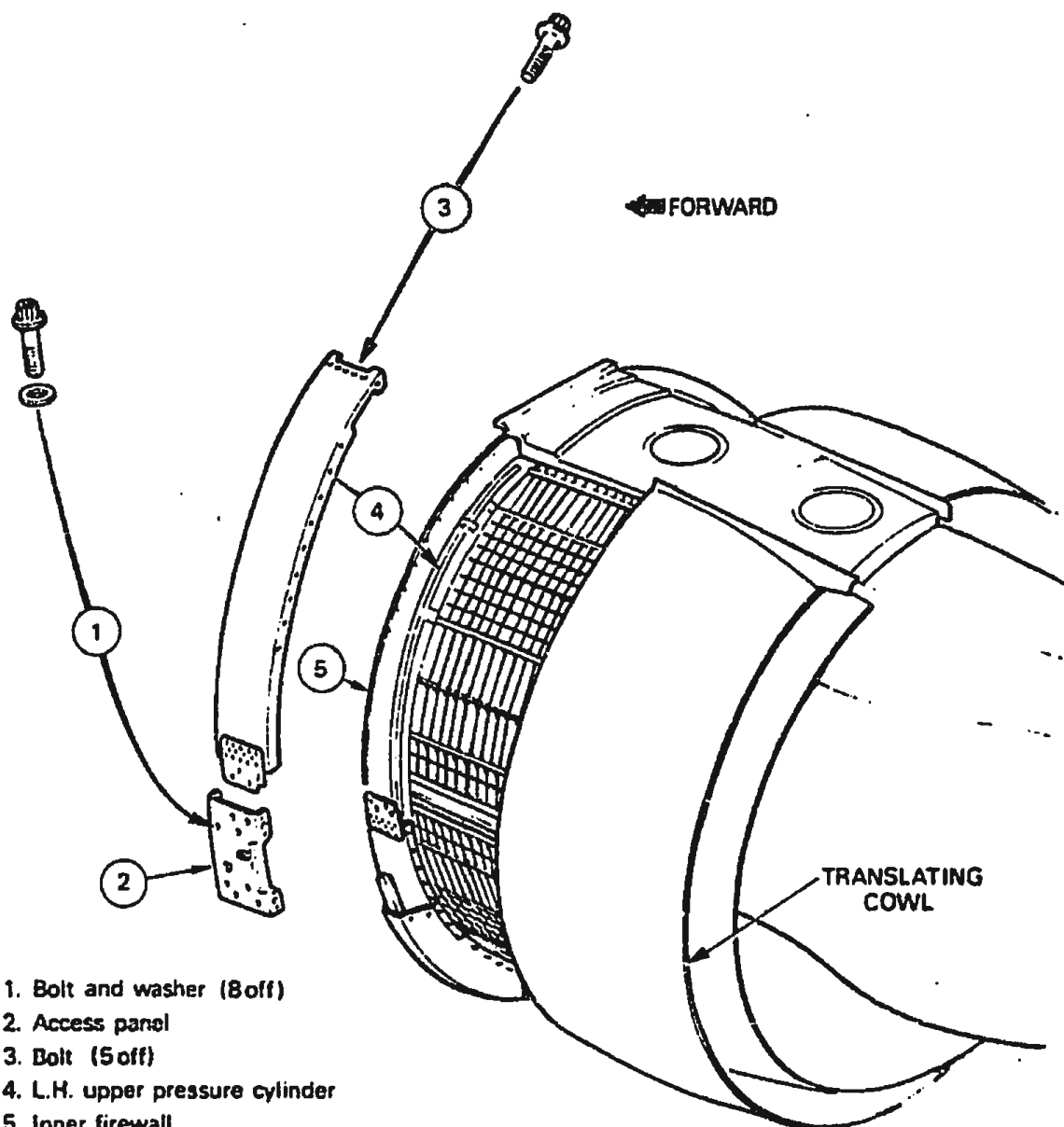
1A

71-30-01
CONFIG-2
Page 415
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



37367A

Upper L.H. pressure cylinder - Removal/Installation
(S.B.78-3875 Pre S.B.78-3882)
Fig.406 (Sheet 1)

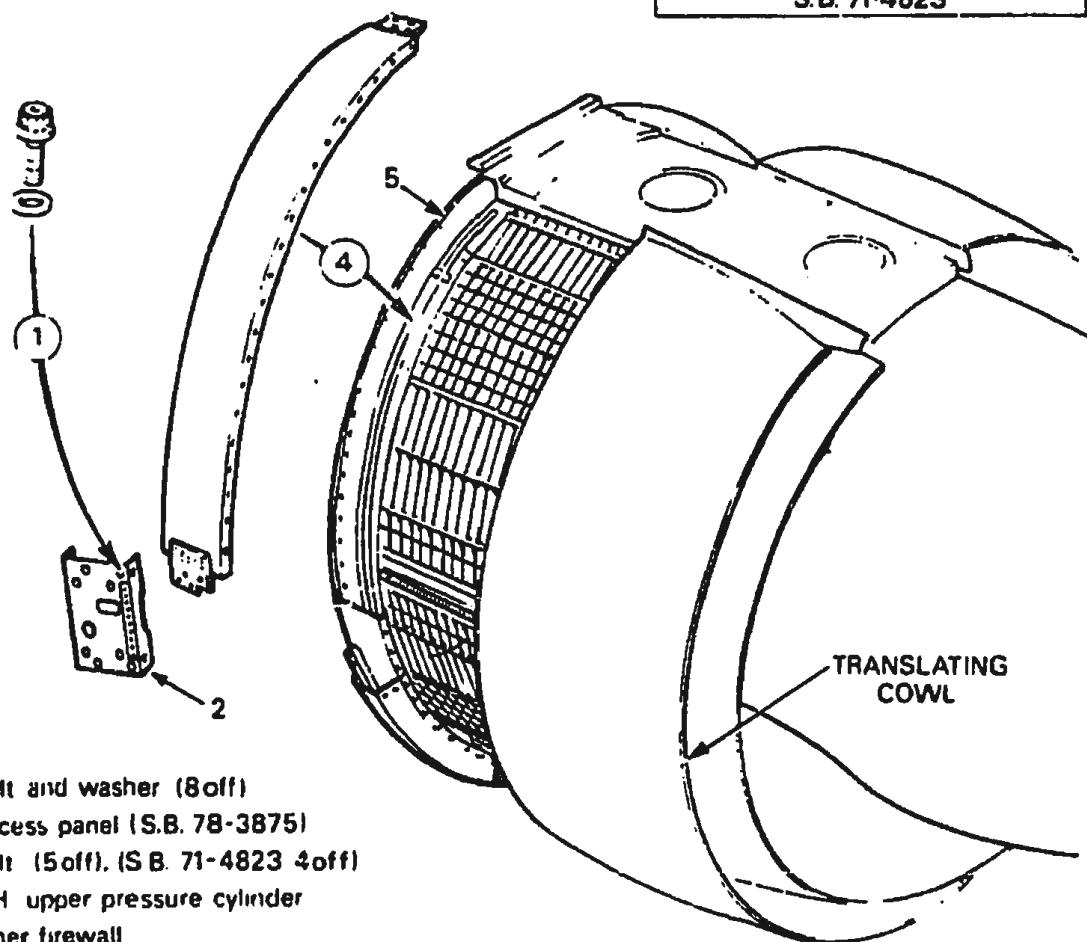
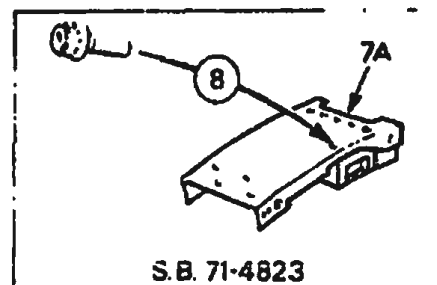
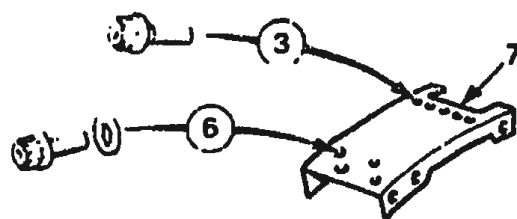
REFFECTIVITY: RB211-22B-02/10

0508

1A

71-30-01
CONFIG-2
Page 416
Nov 15/81

RB.211 Propulsion System
MAINTENANCE



- 1 Bolt and washer (8off)
- 2 Access panel (S.B. 78-3875)
- 3 Bolt (5off). (S.B. 71-4823 4off)
- 4 L.H. upper pressure cylinder
- 5 Inner firewall
- 6 Bolt and washer (4off)
- 7 Upper L.H. pressure cylinder access panel (S.B. 78-3882)
- 7A Upper L.H. pressure cylinder access panel (S.B. 71-4823)
- 8 Bolts and washers 2off S.B. 71-4823

39888A

Upper L.H. pressure cylinder - Removal/Installation
(S.B.78-3875, S.B.78-3882 and S.B.71-4823)
Fig.406 (Sheet 2)

050B EFFECTIVITY: RB211-22B-02/10

1A

71-30-01
CONFIG-2
Page 417
Nov 15/81

 RB.211 Propulsion System
MAINTENANCE

3. Remove Firewall and Pressure Cylinder Assembly on engines incorporating S.B.78-3875

The procedure for gaining access to individual translating cowl gearboxes is contained in the following paragraphs:

R.H. upper (No.1) and centre (No.2) gearboxes - Paragraph A.

L.H. upper (No.6) (Engines not incorporating S.B.78-3882) and centre (No.5) gearboxes - Paragraph C.

Lower R.H. (No.3) and L.H. (No.4) gearboxes - Paragraph E.

L.H. upper (No.6) (Engines incorporating S.B.78-3882) gearbox - Paragraph G.

NOTE: The translating cowl gearboxes are numerically identified viewed from the rear.

In the event of a thrust reverser system failure that prevents thrust reverser operation to reverse thrust position or the translating cowl being manually cycled rearwards, carry out manual traversing procedure (Ref.78-31-07).

CAUTION: THE WEIGHT OF EACH DETACHABLE FIREWALL ASSEMBLY IS APPROXIMATELY 11LB. (5 KG.). THE WEIGHT OF THE PRESSURE CYLINDER AND FIREWALL ASSEMBLY IS APPROXIMATELY 26LB. (12 KG.).

Service Bulletins referred to:

- S.B.36-2441 - Introduction of Thrust Reverser De-activating Valve.
- S.B.71-2278 - Introduction of De-activating Valve Mounting Bracket.
- S.B.71-2662 - L.D. Harness and A.I.D.S. Loom Re-routed to Clear Feedback Linkage.
- S.B.71-2831 - Introduction of Tell-tale Drains system.
- S.B.71-4823 - Introduction of Upper R.H. and L.H. Pressure Cylinder Sealing Bracket.
- S.B.73-2232 - Introduction of Self-consuming Drains System.
- S.B.78-3608 - Introduction of Detachable Cowl Lock Indicator Housings.
- S.B.78-3875 - Introduction of Engine Firewall - Pressure Cylinder with Removable Sections.
- S.B.78-3882 - Detachable Firewall and Pressure Cylinder with Removable Sections Giving Access to Feedback Gearboxes.

2

R EFFECTIVITY: RB211-22B-02/10

R

050B

2A

71-30-01
CONFIG-2
Page 418
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

Referenced Procedures:

24-11-08	Oil Cooler - Removal/Installation.
70-02-01	Identification, Lubrication and Fitting of Rubber Sealing Rings.
71-11-01	L.H. Hinged Cowl - Removal/Installation.
71-11-02	R.H. Hinged Cowl - Removal/Installation.
71-12-01	L.H. and R.H. Lower Hinged Cowl - Removal/Installation.
71-12-03	L.H. and R.H. Mid Fixed Cowls - Removal/Installation.
71-12-05	L.H. and R.H. Upper Hinged Cowl - Removal/Installation.
78-30-00	Thrust Reverser - Servicing.
78-31-07	Translating Cowl - Maintenance Practices.
78-31-42	Thrust Reverser De-activation Valve - Maintenance Practices.
79-21-01	Air-cooled Oil Cooler - Maintenance Practices.

Illustrated Parts Catalogue references:

The I.P.C. sections where parts disturbed during the following operations can be located are as follows:

26-11-02	Fire Detection System - Ejector Sensor Assembly.
71-00-00	Centre Engine Cowl Seal Assembly.
71-30-01	Engine Firewall.
71-30-02	No.2 Engine Firewall Extension.
71-70-02	Engine Drain Tubes and Fittings.
71-70-03	Power Plant Drain Tubes and Fittings.

A. Remove Upper R.H. Detachable Firewall Assembly and Pressure Cylinder

- (1) Operate thrust reverser to reverse thrust position (Ref.78-30-00).
- (2) **WARNING:** ENSURE THRUST REVERSER SYSTEM IS LOCKED IN REVERSER THRUST POSITION WHILE WORK IS IN PROGRESS.
Deactivate and tag thrust reverser and associated systems and fit thrust reverser locks (Ref.78-30-00).
- (3) No.1 and No.3 engines
 - (a) Remove R.H. hinged cowl 414A or 424A (Ref.71-11-02).

2

R EFFECTIVITY: RB211-22B-02/10

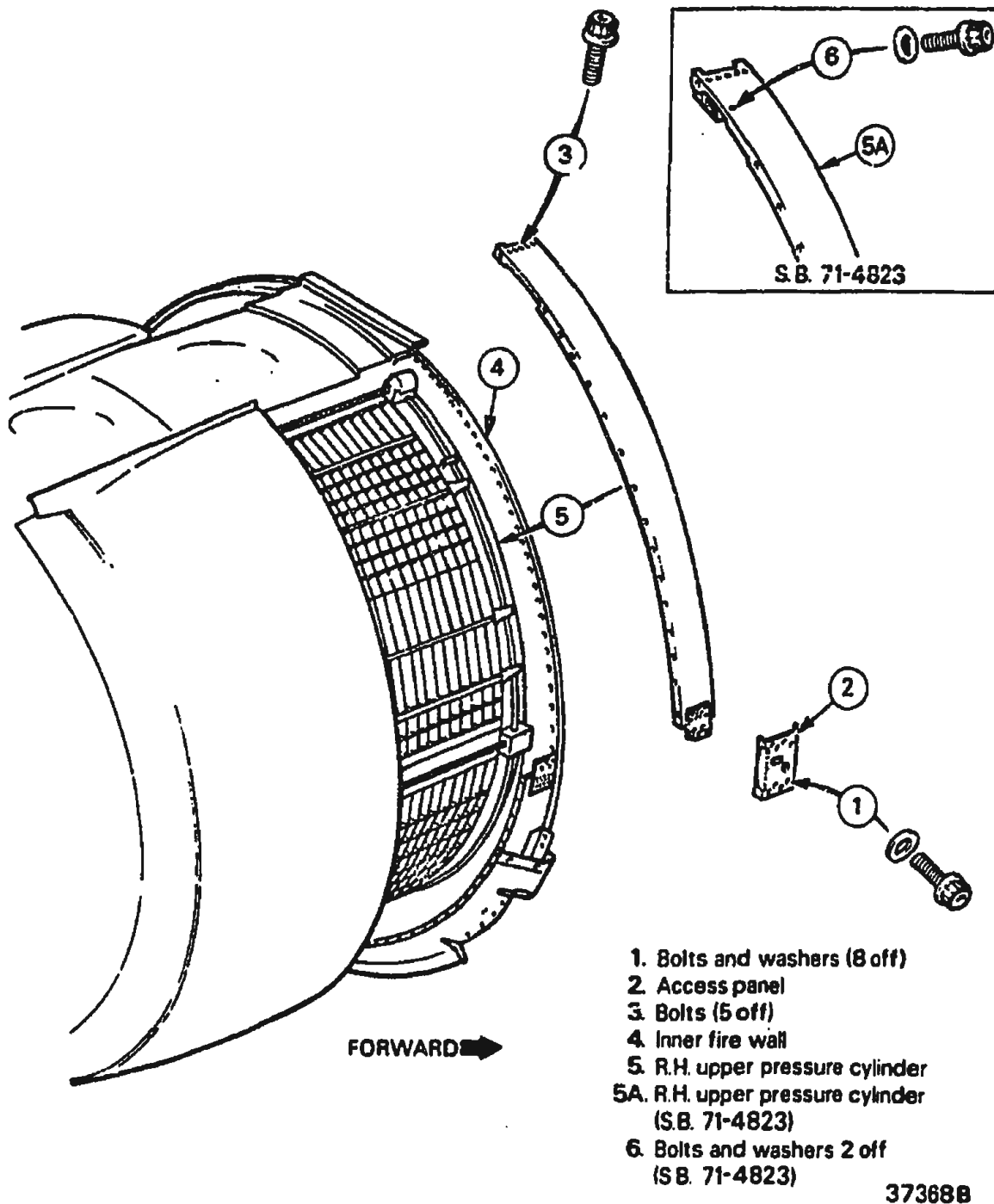
R

050B

2A

71-30-01
CONFIG-2
Page 419
Jun 15/94

RB.211 Propulsion System
MAINTENANCE



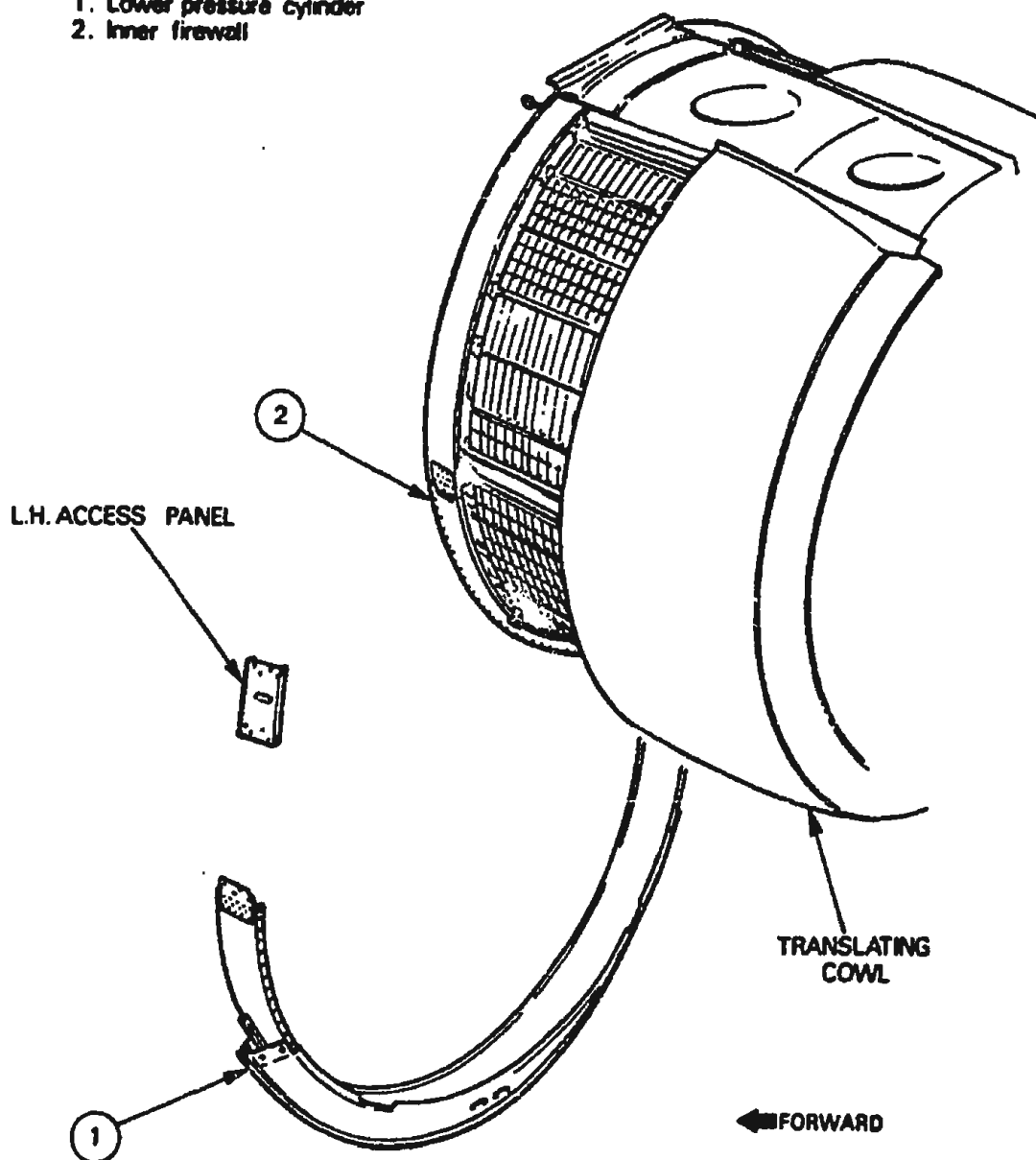
Upper R.H. pressure cylinder - Removal/Installation
 (S.B.78-3875 and S.B.71-4823)
 Fig.407



RB.211 Propulsion System

MAINTENANCE

1. Lower pressure cylinder
2. Inner firewall



37389A

Lower fixed firewall and pressure cylinder assembly
Removal/Installation (S.B.78-3875)
Fig.408

050B EFFECTIVITY: RB211-22B-02/10

2A

71-30-01
CONFIG-2
Page 421
Nov 15/81



RB.211 Propulsion System

MAINTENANCE

(4) No.2 engine

- (a) Remove L.H. and R.H. upper hinged cowls, 433DL and 434DR (Ref.71-12-05).
- (b) Remove L.H. and R.H. lower hinged cowls, 433AL and 434AR (Ref.71-12-01).
- (c) Remove L.H. and R.H. mid fixed cowls, 433CL and 434CR (Ref.71-12-03).
- (d) Refer to fig.401, remove bolts (1) then move cowl seal clear of firewall.
- (e) Remove bolts (2) then remove R.H. firewall extension (5).

(5) Remove Upper R.H. Detachable Firewall Assembly

- (a) Refer to fig.403 (Sheet 1 or 2), on engines incorporating S.B.36-2441 remove deactivation valve (Ref.78-31-42).
- (b) On engines incorporating S.B.71-2278, remove bolts and washers (1) and bracket (2).
- (c) Remove bolts (3) and (4) and bolts and washers (5) noting positions of brackets (8) and (9) for assembly.
- (d) On engines with S.B.71-4823, remove bolt and washer (13), refer to fig.403 (sheet 2).
- (e) Release fasteners (6) and remove upper R.H. detachable firewall assembly (7).
- (f) If the upper R.H. detachable firewall assembly is being replaced by a new firewall assembly on engines incorporating S.B.78-3608, remove the R.H. cowl lock indicator box assembly as follows:

Refer to fig.403 (Sheet 2), remove bolts (10) and (11) then remove R.H. cowl lock indicator box assembly (12) and retain for fitment to new firewall assembly.



RB.211 Propulsion System

MAINTENANCE

(6) Remove Upper R.H. Pressure Cylinder

- (a) Remove bolts and washers (1) and withdraw access panel (2) from pressure cylinder, refer to fig.407.
- (b) Remove bolts (3) and withdraw upper R.H. pressure cylinder (5) from inner firewall (4).
- (c) On engines with S.B.71-4823 remove bolts (3) and withdraw upper R.H. pressure cylinder (5A) from inner firewall (4).
- (d) If pressure cylinder (5A) is being replaced by a new pressure cylinder remove sealing bracket as follows:

Remove bolts and washers (6) and retain sealing bracket for fitment to new access panel (5A), refer to fig.407.
- (e) Fit approved blanks to all exposed apertures and connectors.

B. Install Upper R.H. Detachable Firewall Assembly and Pressure Cylinder

(1) Equipment required:

Clean, stiff-bristled brush

(2) Material required:

	British Spec./Ref.	American Spec./Ref.	OMat Item No.
Degreasing fluid (Inhibited 1.1.1. trichloroethane)	BS.4487 1969	Mil-T-81533	1/21
Jointing compound	PL.32	-	4/46



RB.211 Propulsion System

MAINTENANCE

- (3) Ensure thrust reverser is locked and systems are deactivated and tagged as detailed in operation 3.A.(2).
- (4) Remove blanks from all connectors and apertures.
- (5) **WARNING:** WHEN USING DEGREASING FLUID, ENSURE ADEQUATE VENTILATION AND AVOID SKIN CONTACT AND INHALING THE VAPOUR.
Cold liquid degrease mating faces of upper R.H. detachable firewall assembly, upper R.H. pressure cylinder, R.H. firewall extension (No.2 engine only) and inner firewall and allow to dry.
- (6) Brush apply a thin film of jointing compound to mating faces of upper R.H. detachable firewall assembly, upper pressure cylinder, R.H. firewall extension (No.2 engine only) and inner firewall. Allow compound to dry for a minimum period of 10 minutes.
- (7) Install Upper R.H. Pressure Cylinder
 - (a) If upper R.H. pressure cylinder is being replaced by a new pressure cylinder on engines with S.B.71-4823, fit R.H. pressure cylinder sealing bracket to new pressure cylinder as follows:

Fit sealing bracket to upper R.H. pressure cylinder (5A) and secure with bolts and washers (6), refer to fig.407.
 - (b) Fit upper R.H. pressure cylinder (5) to the inner firewall (4) and secure with bolts (3).
 - (c) On engines with S.B.71-4823 fit upper R.H. pressure cylinder (5A) to inner firewall (4) and secure with bolts (3).
 - (d) Fit access panel (2) and secure with bolts and washers (1).



RB.211 Propulsion System

MAINTENANCE

(8) Install Upper R.H. Detachable Firewall Assembly

- (a) If the upper R.H. detachable firewall assembly is being replaced by a new firewall assembly on engines incorporating S.B.78-3608, fit the existing R.H. cowl lock indicator box assembly as follows:

Refer to fig.403 (Sheet 2), fit the R.H. cowl lock indicator box assembly (12) to the upper R.H. detachable firewall assembly (7) then fit and secure bolts (10) and (11).

- (b) Refer to fig.403 (Sheet 1 or 2), position upper R.H. detachable firewall assembly (7) over pressure cylinder assembly, ensuring indicator rod lever passes through clearance hole in access panel (2) (fig.407) to seat on topside of lock yoke, depressing the indicator rod lever and extending the indicator rod.
- (c) Refer to fig.403 (Sheet 1 or 2), fit and secure bolts (3) and (4) then bolts and washers (5) ensuring brackets (8) and (9) are correctly positioned on firewall. Secure fasteners (6).
- (d) On engines with S.B.71-4823 fit and secure bolts and washers (12), refer to fig.403 (sheet 2).
- (e) On engines incorporating S.B.71-2278, position bracket (2) on upper R.H. detachable firewall assembly (7) and secure with bolts and washers (1).
- (f) On engines incorporating S.B.36-2441, fit de-activation valve (Ref.78-31-42).



RB.211 Propulsion System

MAINTENANCE

(9) No.2 engine

- (a) Refer to fig.401, position R.H. firewall extension (5) and secure with bolts (2).
- (b) Position cowl seal on firewall and secure with bolts (1).

(10) No.1 and No.3 engines

- (a) Fit R.H. hinged cowl 414A or 424A (Ref.71-11-02).

(11) No.2 engine

- (a) Fit L.H. and R.H. upper hinged cowls, 433DL and 434DR (Ref.71-12-05).
- (b) Fit L.H. and R.H. lower hinged cowls, 433AL and 434AR (Ref.71-12-01).
- (c) Fit L.H. and R.H. mid fixed cowls, 433CL and 434CR (Ref.71-12-03).

(12) Unlock and reactivate thrust reverser and associated systems (Ref.78-30-00).

C. Remove Upper L.H. Detachable Firewall Assembly and Pressure Cylinder

- (1) Operate thrust reverser to reverse thrust position (Ref.78-30-00).
- (2) **WARNING:** ENSURE THRUST REVERSER SYSTEM IS LOCKED IN REVERSE THRUST POSITION WHILE WORK IS IN PROGRESS.
Deactivate and tag thrust reverser and associated systems and fit thrust reverser locks (Ref.78-30-00).
- (3) No.1 and No.3 engines
 - (a) Remove L.H. hinged cowl, 413A or 423A (Ref.71-11-01).



RB.211 Propulsion System

MAINTENANCE

(4) No.2 engine

- (a) Remove L.H. and R.H. upper hinged cowls, 433DL and 434DR (Ref.71-12-05).
- (b) Remove L.H. and R.H. lower hinged cowls, 433AL and 434AR (Ref.71-12-01).
- (c) Remove L.H. and R.H. mid fixed cowls, 433CL and 434CR (Ref.71-12-03).
- (d) Refer to fig.401, remove bolts (1) then remove cowl seal clear of firewall.
- (e) Remove bolts (2) and (3) then remove L.H. firewall extension (4).

(5) Remove Upper L.H. Detachable Firewall Assembly

- (a) Refer to fig.402 (Sheet 1 or 2), remove A.C.O.C. outlet duct (Ref.79-12-01).
- (b) Remove bolts (1) and bolts and washers (2).
- (c) On engines with S.B.71-4823 remove bolt and washer (13), refer to fig.402 (sheet 2).
- (d) Remove bolts (3) and slacken bolts (4).
- (e) Release fasteners (5) and remove upper L.H. detachable firewall assembly (6).
- (f) If the upper L.H. detachable firewall assembly is being replaced by a new firewall assembly on engines incorporating S.B.78-3608, remove the L.H. cowl lock indicator box assembly as follows:

Refer to fig.402 (Sheet 2), remove bolts (7) and (8) then remove L.H. cowl lock indicator box assembly (9) and retain for fitment to new firewall assembly.



RB.211 Propulsion System

MAINTENANCE

(6) Remove Upper L.H. Pressure Cylinder

- R (a) Refer to fig.406 (Sheet 1 or 2), remove bolts and washers (1) then access panel (2).
- R (b) On engines without SB 78-3882 remove bolts (3) and lift-off upper L.H. pressure cylinder (4) from inner firewall (5).
- R (c) On engines with SB 78-3882 remove bolts (3), bolts and washers (6) and withdraw access panel (7), then lift-off upper L.H. pressure cylinder (4) from inner firewall.
- R (d) Fit approved blanks to all exposed apertures and connectors.

D. Install Upper L.H. Detachable Firewall Assembly and Pressure Cylinder

(1) Equipment required:

Clean, stiff-bristled brush.

(2) Material required:

	British Spec./Ref.	American Spec./Ref.	OMat Item No.
Degreasing fluid (Inhibited and stabilized 1.1.1. trichloroethane)	B.S.4487 1969	Mil-T-81533	1/21
Jointing compound	PL.32	-	4/46

(3) Ensure thrust reverser is locked and systems deactivated and tagged as detailed in operation 3.C.(1).

(4) Remove blanks from all connectors and apertures.



RB.211 Propulsion System

MAINTENANCE

- (5) **WARNING:** WHEN USING DEGREASING FLUID, ENSURE ADEQUATE VENTILATION AND AVOID SKIN CONTACT AND INHALING THE VAPOUR.

Cold liquid degrease mating faces of upper L.H. detachable firewall assembly, upper L.H. pressure cylinder, L.H. firewall extension (No.2 engine only) and inner firewall and allow to dry.

- (6) Brush apply a thin film of jointing compound to mating faces of upper L.H. detachable firewall assembly, upper L.H. pressure cylinder, L.H. firewall extension (No.2 engine only) and inner firewall. Allow compound to dry for a minimum period of 10 minutes.

- (7) Install Upper L.H. Pressure Cylinder

- R (a) On engines without SB 78-3882 refer to fig.406 (Sheet 1), fit upper L.H. pressure cylinder (4) to inner firewall (5) then fit and secure bolts (3).
- R (b) On engines with SB 78-3882, refer to fig.406 (Sheet 2) fit upper L.H. pressure cylinder (4) to inner firewall. Fit and secure access panel (7) using bolts and washes (6) and bolts (3).
- R (c) Fit and secure access panel (2) using bolts and washers (1).

- (8) Install Upper L.H. Detachable Firewall Assembly

- (a) If the upper L.H. detachable firewall assembly is replaced by a new firewall assembly on engines incorporating S.B.78-3608, fit the existing L.H. cowl lock indicator box assembly as follows:

Refer to fig.402 (Sheet 2), fit the L.H. cowl lock indicator box assembly (9) to the upper L.H. detachable firewall assembly (6) then fit and secure bolts (7) and (8).

- (b) Refer to fig.402 (Sheet 1 or 2), position upper L.H. detachable firewall assembly (6) over pressure cylinder assembly, ensuring indicator rod lever passes through clearance hole in access panel (2) fig.406 (Sheet 1 or 2) to seat on topside of lock yoke depressing the indicator rod lever and extending the indicator rod.

2

EFFECTIVITY: RB211-22B-02/10

050B

2A

71-30-01
CONFIG-2
Page 429
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

- (c) Refer to fig.402 (Sheet 1 or 2), fit and secure bolts (1), (3), bolts and washers (2) and fully tighten bolts (4). Secure fasteners (5).
 - (d) On engines with S.B.71-4823 fit and secure bolt and washer (13), refer to fig.402 (sheet 2).
 - (e) Fit A.C.O.C. outlet duct (Ref.79-21-01).
 - (9) No.2 engine
 - (a) Refer to fig.401, position L.H. firewall extension (4) and secure with bolts (3) and (2).
 - (b) Position cowl seal on firewall and secure with bolts (1).
 - (10) No.1 and No.3 engines
 - (a) Fit L.H. hinged cowl 413A/423A (Ref.71-11-01).
 - (11) No.2 engine
 - (a) Fit L.H. and R.H. upper hinged cowls, 433DL and 434DR (Ref.71-12-05).
 - (b) Fit L.H. and R.H. lower hinged cowls, 433AL and 434AR (Ref.71-12-01).
 - (c) Fit L.H. and R.H. mid fixed cowls, 433CL and 434CR (Ref.71-12-03).
 - (12) Unlock and reactivate thrust reverser and associated systems (Ref.78-30-00).
- E. Remove Lower Firewall and Pressure Cylinder Assembly
- (1) Operate thrust reverser to reverse thrust position (Ref.78-30-00).
 - (2) **WARNING:** ENSURE THRUST REVERSER SYSTEM IS LOCKED IN REVERSE THRUST POSITION WHILE WORK IS IN PROGRESS.
Deactivate and tag thrust reverser and associated systems, and fit thrust reverser locks (Ref.78-30-00).



RB.211 Propulsion System

MAINTENANCE

- (3) No.1 and No.3 engines
 - (a) Remove L.H. and R.H. hinged cowls 413A or 423A (Ref.71-11-01) and 414A or 424A (Ref.71-11-02).
- (4) No.2 engine
 - (a) Remove L.H. and R.H. upper hinged cowls, 433DL and 434DR (Ref.71-12-05).
 - (b) Remove L.H. and R.H. lower hinged cowls, 433AL and 434AR (Ref.71-12-01).
 - (c) Remove L.H. and R.H. mid fixed cowls, 433CL and 434CR (Ref.71-12-03).
 - (d) Refer to fig.401, remove bolts (1) then remove cowl seal clear of firewall.
 - (e) Remove bolts (2) and (3) then remove L.H. and R.H. firewall extensions (4) and (5).
- (5) Remove Upper L.H. Detachable Firewall Assembly
 - (a) Refer to fig.402 (Sheet 1 or 2), remove A.C.O.C. outlet duct (Ref.79-21-01).
 - (b) Remove bolts (1) and bolts and washers (2).
 - (c) On engines with S.B.71-4823 remove bolt and washer (13), refer to fig.402 (sheet 2).
 - (d) Remove bolts (3) and slacken bolts (4).
 - (e) Release fasteners (5) and remove upper L.H. detachable firewall assembly (6).
- (6) Remove Upper R.H. Detachable Firewall Assembly
 - (a) Refer to fig.403 (Sheet 1 or 2), on engines incorporating S.B.36-2441 remove de-activation valve (Ref.78-31-42).
 - (b) On engines incorporating S.B.71-2278, remove bolts and washers (1) and bracket (2).



RB.211 Propulsion System

MAINTENANCE

- (c) Remove bolts (3) and (4) and bolts and washers (5) noting positions of brackets (8) and (9) for assembly.
- (d) On engines with S.B.71-4823 remove bolt and washer (13), refer to fig.403 (sheet 2).
- (e) Release fasteners (6) and remove upper R.H. detachable firewall assembly (7).
- (f) Remove I.D.G. oil cooler outlet duct (Ref.24-11-08).
- (7) Remove Lower Fixed Firewall and Pressure Cylinder Assembly
 - (a) Refer to fig.404 (Sheet 1 or 2), disconnect connectors (1), (2) and (3).
 - (b) No.2 engine also disconnect connector (4).
 - (c) Refer to fig.406 (Sheet 1), remove bolts and washers (1) then remove L.H. access panel (2).
 - (d) Refer to fig.407, remove bolts and washers (1) then remove R.H. access panel (2).
 - (e) Refer to fig.404 (Sheet 1 or 2), release fasteners (5) and remove sensor assembly (11).
 - (f) Remove bolts and washers (6) noting positions of brackets (7), (8), (9) and (10) for assembly.
 - (g) Refer to fig.408, remove lower fixed firewall and pressure cylinder assembly (1) from inner firewall (2).
 - (h) Fit approved blanks to all exposed apertures and connectors.

F. Install Lower Fixed Firewall and Pressure Cylinder Assembly

(1) Equipment required:

Clean, stiff-bristled brush

RB.211 Propulsion System
MAINTENANCE

(2) Material required:

	British Spec./Ref.	American Spec./Ref.	OMat Item No.
Degreasing fluid (Inhibited and stabilized 1.1.1. trichloroethane)	B.S.4487 1969	Mil-T-81533	1/21
Jointing compound	PL.32	-	4/46

- (3) Ensure thrust reverser is locked and systems are deactivated and tagged as detailed in operation 3.E.(2).
- (4) Remove blanks from all connectors and apertures.
- (5) **WARNING:** WHEN USING DEGREASING FLUID, ENSURE ADEQUATE VENTILATION AND AVOID SKIN CONTACT AND INHALING THE VAPOUR.
Cold liquid degrease mating faces of upper L.H. and R.H. detachable firewall assemblies, lower pressure cylinder and firewall assembly, firewall extensions (No.2 engine only) and inner firewall and allow to dry.
- (6) Brush apply a thin film of jointing compound to mating faces of upper L.H. and R.H. detachable firewall assemblies, lower pressure cylinder and firewall assembly, firewall extensions (No.2 engine only) and inner firewall. Allow compound to dry for a minimum period of 10 minutes.
- (7) Install Lower Fixed Firewall and Pressure Cylinder Assembly
- (a) Refer to fig.408, fit lower pressure cylinder (1) on inner firewall (2).
- (b) Refer to fig.404 (Sheet 1 or 2), fit and secure bolts and washers (6) ensuring brackets (7), (8), (9) and (10) are correctly positioned on firewall.
- (c) Refer to fig.407, fit and secure R.H. access panel (2) using bolts and washers (1).



RB.211 Propulsion System

MAINTENANCE

- (d) Refer to fig.406 (Sheet 1), fit and secure L.H. access panel (2) using bolts and washers (1).
 - (e) Refer to fig.404 (Sheet 1 or 2), fit and lubricate (Ref.70-02-01) new seal rings to connectors (3), (2) and (1); connect and secure connectors (3), (2) and (1).
 - (f) No.2 engine also connect and secure connector (4).
 - (g) Position sensor assembly (11) and secure with fasteners (5).
- (8) Install Upper R.H. Detachable Firewall Assembly
- (a) Refer to fig.403 (Sheet 1 or 2), fit I.D.G. cooler outlet duct (Ref.24-11-08).
 - (b) Position upper R.H. detachable firewall assembly (7) over pressure cylinder assembly ensuring indicator rod lever passes through clearance hole in access panel (2) (fig.407) to seat on topside of lock yoke, depressing the indicator rod lever and extending the indicator rod.
 - (c) On engines with S.B.71-4823 fit and secure bolt and washer (13), refer to fig.403 (sheet 2).
 - (d) Refer to fig.403 (Sheet 1 or 2), fit and secure bolts (3) and (4) and bolts and washers (5) ensuring brackets (8) and (9) are correctly positioned on firewall. Secure fasteners (6).
 - (e) On engines incorporating S.B.71-2278, position bracket (2) on upper R.H. detachable firewall assembly and secure with bolts and washers (1).
 - (f) On engines incorporating S.B.36-2441, fit de-activation valve (Ref.78-31-42).



RB.211 Propulsion System

MAINTENANCE

- (9) Install Upper L.H. Detachable Firewall Assembly**
 - (a)** Refer to fig.402 (Sheet 1 or 2), position upper L.H. detachable firewall assembly (6) over pressure cylinder, ensuring indicator rod lever passes through clearance hole in access panel (2) fig.406 (Sheet 1 or 2) to seat on topside of lock yoke, depressing the indicator rod lever and extending the indicator rod.
 - (b)** Refer to fig.402 (Sheet 1 or 2), fit and secure bolts (1), (3), bolts and washers (2) and fully tighten bolts (4). Secure fasteners (5).
 - (c)** On engines with S.B.71-4823 fit and secure bolt and washer (13), refer to fig.403 (sheet 2).
 - (d)** Fit A.C.O.C. outlet duct (Ref.79-21-01).
- (10) No.2 engine**
 - (a)** Refer to fig.401, position L.H and R.H. firewall extensions (4) and (5) then secure with bolts (3) and (2).
 - (b)** Position cowl seal on firewall and secure with bolts (1).
- (11) No.1 and No.3 engines**
 - (a)** Fit L.H. and R.H. hinged cowls, 413A or 423A (Ref.71-11-01) and 414A or 424A (Ref.71-11-02).
- (12) No.2 engine**
 - (a)** Fit L.H. and R.H. upper hinged cowls, 433DL and 434DR (Ref.71-12-05).
 - (b)** Fit L.H. and R.H. lower hinged cowls, 433AL and 434AR (Ref.71-12-01).
 - (c)** Fit L.H. and R.H. mid fixed cowls, 433CL and 434CR (Ref.71-12-03).
- (13) Unlock and reactivate thrust reverser and associated systems (Ref.78-30-00).**



RB.211 Propulsion System

MAINTENANCE

- G. Remove Upper L.H. Detachable Firewall Assembly and Pressure Cylinder Access Panels on Engines Incorporating S.B.78-3882
- (1) Operate thrust reverser to reverse thrust position (Ref.78-30-00).
 - (2) **WARNING:** ENSURE THRUST REVERSER SYSTEM IS LOCKED IN REVERSER THRUST POSITION WHILE WORK IS IN PROGRESS.
Deactivate and tag thrust reverser and associated systems and fit thrust reverser locks (Ref.78-30-00).
 - (3) No.1 and No.3 engines
 - (a) Remove L.H. hinged cowl, 413A or 423A (Ref.71-11-01).
 - (4) No.2 engine
 - (a) Remove L.H. upper hinged cowl, 433DL (Ref.71-12-05).
 - (b) Refer to fig.401, remove top three of bolts (1), remove bolts (2) and (3) then remove L.H. firewall extension (4).

NOTE: If there is insufficient clearance to remove L.H. firewall extension (4), remove more of bolts (1) until sufficient clearance is obtained.
 - (5) Remove Upper L.H. Detachable Firewall Assembly Access Panel
 - (a) Refer to fig.402 (Sheet 2), remove top five of bolts and washers (2), remove bolts (3), slacken bolts (4) and remove bolts (10) and (11). Remove access panel (12).
 - (6) Remove Upper L.H. Pressure Cylinder Access Panel
 - (a) Remove bolts (3) and the bolts and washers (6), then withdraw access panel (7), refer to fig.406 (sheet 2).
 - (b) On engines with S.B.71-4823, remove bolts (3) and bolts and washers (6), then withdraw the access panel (7A)



RB.211 Propulsion System

MAINTENANCE

- (c) If access panel (7A) is to be replaced by a new access panel, remove sealing bracket as follows:

Remove bolts (8) and retain sealing bracket for fitment to new access panel, refer to fig.406 (sheet 2.)

- (7) Fit approved blanks to all exposed apertures and connectors.

H. Install Upper L.H. Detachable Firewall Assembly and Pressure Cylinder Access Panels on Engines Incorporating S.B.78-3882

- (1) Equipment required:

Clean, stiff-bristled brush

- (2) Material required:

	British Spec./Ref.	American Spec./Ref.	OMat Item No.
Degreasing fluid (Inhibited and stabilized 1.1.1. trichloroethane)	BS4487 1969	Mil-T-81533	1/21
Jointing compound	PL.32	-	4/46

- (3) Ensure thrust reverser is locked and systems deactivated and tagged as detailed in operation 3.G.(2).

- (4) Remove blanks from all apertures and connectors.

- (5) **WARNING:** WHEN USING DEGREASING FLUID, ENSURE ADEQUATE VENTILATION AND AVOID SKIN CONTACT AND INHALING VAPOUR.

Cold liquid degrease mating faces of upper L.H. detachable firewall access panel, upper L.H. pressure cylinder access panel, L.H. firewall extension (No.2 engine only) and inner firewall and allow to dry.

- (6) Brush apply a thin film of jointing compound to mating faces of upper L.H. detachable firewall assembly access panel upper L.H. pressure cylinder access panel, L.H. firewall extension (No.2 engine only) and inner firewall. Allow compound to dry for a minimum period of 10 minutes.

2

R EFFECTIVITY: RB211-22B-02/10

R

050B

2A

71-30-01
CONFIG-2
Page 437
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

- (7) Install Upper L.H. Pressure Cylinder Access Panel
 - (a) If upper L.H. pressure cylinder access panel is being replaced by a new access panel on engines with S.B.71-4823, fit upper L.H. pressure cylinder sealing bracket to new access panel as follows:

Fit sealing bracket to access panel and secure with bolts and washers (8), refer to fig.406 (sheet 2).
 - (b) Fit access panel (7) to upper L.H. pressure cylinder (4) and secure with the bolts (3) and the bolts and washers (6).
 - (c) On engines with S.B.71-4823, fit access panel (7A) to upper L.H. pressure cylinder (4) and secure with bolts (3) and bolts and washers (6).
- (8) Install Upper L.H. Detachable Firewall Assembly Access Panel
 - (a) Refer to fig.402 (Sheet 2), fit access panel (12) to upper L.H. detachable firewall assembly (6) then fit and secure top five of bolts and washers (2) and bolts (3); fully tighten bolts (4) and fit and secure bolts (10) and (11).
- (9) No.2 engine
 - (a) Refer to fig.401, position L.H. firewall extension (4) and secure with bolts (2) and (3). Fit and secure bolts (1).
- (10) No.1 and No.3 engines
 - (a) Fit L.H. hinged cowl, 413A or 423A (Ref.71-11-01).
- (11) No.2 engine
 - (a) Fit L.H. upper hinged cowl, 433DL (Ref.71-12-05).
- (12) Unlock and reactivate thrust reverser and associated systems.



BB.211 Propulsion System

MAINTENANCE

ENGINE FIREWALL - INSPECTION/CHECK

1. Inspect Engine Firewall

Reference Procedures

78-30-00	Thrust Reverser - Servicing
71-11-00	Cowling Engines No.1 and No.3 - Servicing
71-12-01	Lower Hinged Cowl No.2 Engine - Servicing
71-12-05	Upper Hinged Cowl No.2 Engine - Servicing

A. Prepare engine for inspection

- (1) Operate thrust reverser system to reverse thrust position (Ref.78-30-00).
- (2) WARNING: ENSURE THAT THRUST REVERSER SYSTEM IS LOCKED IN REVERSE THRUST POSITION WHILE WORK IS IN PROGRESS.

Deactivate and tag thrust reverser and associated systems and fit thrust reverser mechanical locks (Ref.78-30-00).

- (3) Open No.1 and No.3 engine hinged cowls (Ref.71-11-00) as follows.
 - (a) No.1 Engine - 413A Left and 414A Right.
 - (b) No.3 Engine - 523A Left and 424A Right.
- (4) Open No.2 engine doors and panels (Ref.71-12-01) and (Ref.71-12-05) as follows:
 - (a) Left side - 433DL, 433CL and 433AL.
 - (b) Right side - 434DR, 434CR and 434AR.

R EFFECTIVITY: ALL

050B

1A

71-30-01
Page 601
Nov 15/85



RB.211 Propulsion System MAINTENANCE

R B. Inspection.

- R (1) Inspect firewall for dents, cracks, scores and
R abrasions.
- R (2) Inspect for loose or missing rivets, missing bolts
R and anchor nuts.
- R (3) Visually inspect:
 - R (a) Aluminium fixed lower outer fairing.
 - R (b) Aluminium LH and RH detachable firewall.
 - R (c) Pressure cylinder.
 - R (d) Titanium LH and RH outer segments.
- R (4) Stop drill each end of any acceptable crack using a
R 0.125in. (3,175 mm.) diameter drill.
- R Cracks which have been stop drilled should be
R monitored to ensure further cracking does not occur.

R C. Restore engine to pre-inspection standard.

- R (1) Unlock and reactivate thrust reverser and associated
R systems and remove do-not-operate identifiers (Ref.
R 78-30-00, Servicing).
- R (2) Operate thrust reverser system to forward thrust
R position (Ref. 78-30-00 Adjustment/Test).
- R (3) Close left and right hand hinged cowls (Ref.71-11-02,
R Maintenance Practices).

EFFECTIVITY: ALL

050B

1A

71-30-01
Page 602
May 15/82



RB.211 Propulsion System

MAINTENANCE

D. Acceptance standards.

(1) Cracks

R

- (a) Cracks in the aluminium outer fairing, LH and RH detachable firewall and fixed lower outer fairing:
 - (i) Cracks up to 1.00in. (25,4 mm.) in length are acceptable provided they are stop drilled at each end.
 - (ii) Cracks in excess of 1.00in. (25,4 mm.) up to a maximum of 3.00in. (76,2 mm.) are acceptable provided they are stop drilled at each end, there is a minimum of 4.00in. (101,6 mm.) of sound crack free material between individual cracks, and they are inspected at regular intervals to ensure the 3.00in. (76,2 mm.) limit is not exceeded.
- (b) Cracks in excess of 3.00in. (76,2 mm.) are not acceptable.
- (c) Cracks around the LH and RH detachable firewall mounting bolts up to 0.500in. (12,7 mm.) in length are acceptable, provided they are stop drilled and that capping material either side is sound and crack free.
- (d) Cracks in the pressure cylinder are not acceptable.
- (e) Cracks in the titanium LH and RH segments are not acceptable.

(2) Dents

- (a) Smooth dents in firewall inner assembly, outer fairings, removable outer fairings and lower make-up pieces to a depth not exceeding 0.10in. (2,54 mm.) provided diameter does not exceed 2in. (50,8 mm.) and they are not less than 4in. (101,6 mm.) apart.
- (b) Smooth dents in RH and LH detachable firewall assemblies to a depth not exceeding 0.20in. (50,8 mm.) and they are not less than 4.00in. (101,6 mm.) apart.

EFFECTIVITY: ALL

050B

1A

71-30-01

Page 603
Nov 15/85



RB.211 Propulsion System

MAINTENANCE

R

(3) Scores

R
R
R
R
R

(a) Scores in firewall outer fairings, removable outer fairings and lower make-up pieces to a depth not exceeding 0.005in. (0,127 mm.), provided they do not exceed 2in. (50,8 mm.) in length.

R
R
R
R
R

(b) Scores in RH and LH detachable firewall assemblies to a depth not exceeding 0.015in. (0,381 mm.), provided they do not exceed 2.00in. (50,8 mm.) in length and are protectively treated (Ref.70-42-12).

R
R
R

(4) Abrasions in firewall inner assembly, firewall outer fairings, removable outer fairings and lower make-up pieces, must be polished out.

R

(5) Loose or missing rivets are not acceptable.

R

(6) Missing bolts and anchor nuts are not acceptable.

EFFECTIVITY: ALL

050B

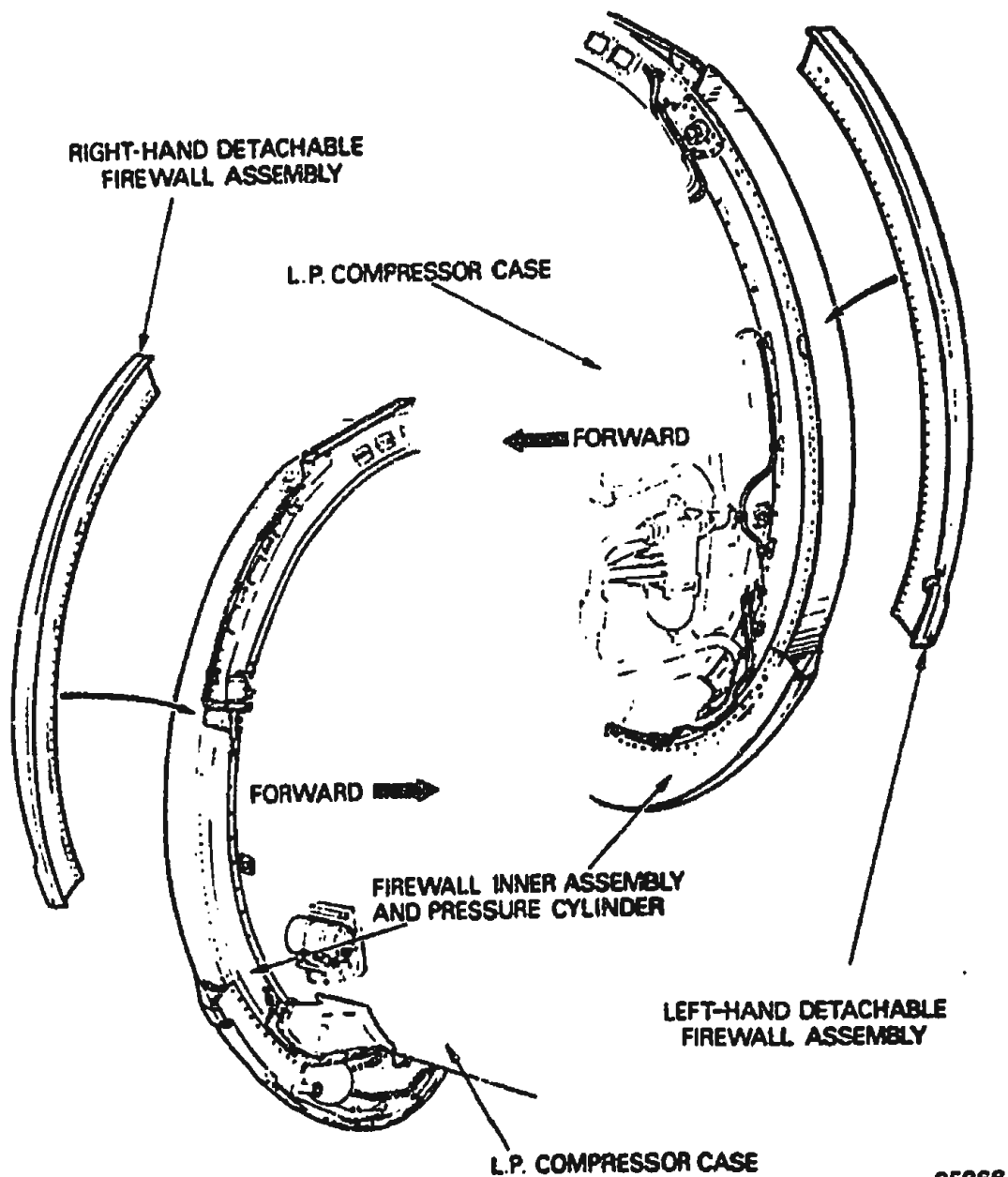
1A

71-30-01
Page 604
May 15/82



RB.211 Propulsion System

MAINTENANCE



35866

R
R

Engine Firewall - Inspection/Check
Fig.601

EFFECTIVITY: ALL

0508

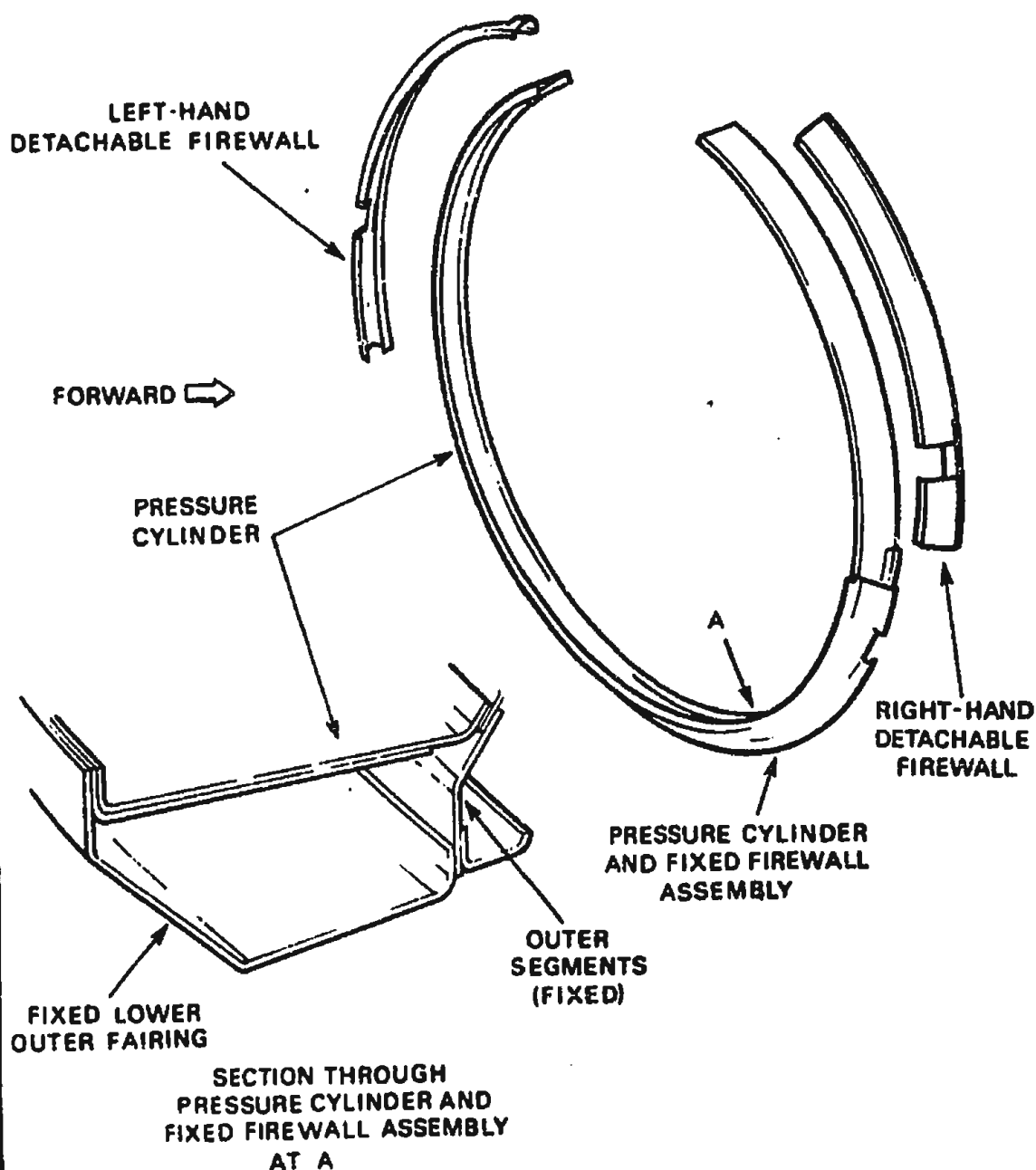
1A

71-30-01
Page 605
May 15/82



RB.211 Propulsion System

MAINTENANCE



49897

R
R

Engine Firewall - Inspection/Check
Fig.602

EFFECTIVITY: ALL

0508

1A

71-30-01

Page 606
May 15/82



RB.211 Propulsion System

MAINTENANCE

ENGINE FIREWALL EXTENSION (ENGINE NO.2) - INSPECTION/CHECK

1. Inspect Engine Firewall Extension

A. General Inspection

- (1) Inspect for cracks, dents, scores and abrasions.
- (2) Inspect for loose or missing rivets and missing bolts and anchor nuts.

B. Acceptance Standards

- (1) Cracks
 - (a) Cracks are not acceptable.
- (2) Dents
 - (a) Smooth dents to a depth not exceeding 0.10in. (2,54 mm.) providing diameter does not exceed 2in. (50,8 mm.) and they are not less than 4in. (101,6 mm.) apart.
- (3) Scores
 - (a) Scores to a depth not exceeding one twenty-fifth (4 per cent.) of material thickness, providing they do not exceed 2in. (50,8 mm.) in length.
- (4) Abrasions
 - (a) Abrasions must be polished out.
- (5) Loose or missing rivets must be replaced.
- (6) Missing bolts and anchor nuts which create a firepath hazard are not acceptable.
- (7) Torn, holed or damaged seals are not acceptable.

EFFECTIVITY: ALL

0508

16

71-30-02
Page 601/602
May 15/77



RB.211 Propulsion System

MAINTENANCE

R ENGINE FIRESEAL - INSPECTION/CHECK

R 1. Inspect Engine Fireseal

R Referenced Procedures.

R 72-03-00 Gas Generator Fairings - Removal/Installation
R 78-30-00 Thrust Reverser - Servicing

R Illustrated Parts Catalogue References.

R The I.P.C. sections where parts disturbed during the
R following operations can be located are as follows:

R 72-03-03 Turbine Section Gas Generator Fairings
R 72-03-00 Engine Interservices Gas Generator Fairings
R 72-03-02 Combustion Section Gas Generator Fairings

R A. Inspection

R (1) WARNING: ENSURE THRUST REVERSER SYSTEM IS LOCKED IN
R FORWARD THRUST POSITION WHILST WORK IS IN
R PROGRESS.
R Deactivate and tag thrust reverser and associated
R systems and fit thrust reverser locks (Ref.
R 78-30-00).

R (2) Remove the following gas generator fairings (Ref.
R 72-03-00):

R Combustion section fairings
R Pylon front R.H. access panel
R Pylon front L.H. access panel
R Turbine section fairings

R (3) Inspect the fireseal for the following damage:

R (a) Inspect fireseal sealing strips for cracks and
R damage.

R (b) Inspect fireseal metal structure for cracks.

R For acceptance standards refer to para.B.



RB.211 Propulsion System

MAINTENANCE

(4) Refit gas generator fairings removed in operation
A.(2).

(5) Unlock and re-activate thrust reverser and associated
systems (Ref. 78-30-00).

B. Acceptance Standards

Circumferential cracking of fireseal metal structure is
not acceptable.

(1) Damage

(a) Loss of sealing strip at a maximum of 10
positions in each front and rear sealing strips
providing each missing piece does not exceed
1.0in. (25.4 mm.) in length and 30% of
individual sealing strip width, and that
missing pieces in front and rear sealing strips
do not coincide.

(2) Cracks

(a) Radial cracking of the fireseal metal structure
at a maximum of 4 positions provided that there
is a minimum of 6.0in. (152.4 mm.) between
cracks and that cracks do not exceed half the
fireseal height.

EFFECTIVITY: ALL

71-30-03

Page 602
Nov 15/77

1A



RB.211 Propulsion System

MAINTENANCE

ELECTRICAL HARNESS - DESCRIPTION AND OPERATION

1. General

An electrical harness is fitted to the engine to provide interconnection between the engine and aircraft systems and between the engine and its control systems. Connections are also provided to facilitate ground testing of specific systems.

The electrical harness comprises three individual harnesses as follows:

- R Engine light duty electrical harness (Ref. para.2.A.)
- R Nose cowl light duty electrical harness (Engines No.1 and 3) (Ref. para.2.B.)
- R Engine fire and overheat detection harness (Ref. para.2.C.)

On engines incorporating A.I.D.S., there is an additional harness

- R A.I.D.S. light duty electrical harness (Ref. para.2.D.)

- R External views of the harnesses on the engine are illustrated in fig.1 to 5, the multi-terminal, master junction block is illustrated in fig.6, 7, 7A and 7B. The propulsion system wiring diagrams are illustrated in fig.8 to 24.

To simplify the propulsion system wiring diagrams the circuitry identifications have been replaced with a coding system (based on engine mark number, interface plug identification and pin number). The associated key to the wiring diagram provides the circuitry identifications applicable to the coding.

Service Bulletins referred to:

- S.B.77-2071 - Introduction of Airborne Integrated Data System (A.I.D.S.)
- S.B.24-2750 - I.D.G. Control Cable Identification Sleeves Change of Colour Code.
- S.B.71-2833 - Pylon/Fancase to Splitter Break Loom with Additional Resistors.
- R S.B.71-3117 - Introduction of drip loops to general services (Cat 4) loom.
- R S.B.78-3282 - Deactivation of Hot Stream Spoiler System.
- R S.B.72-3310 - Introduction of steel fabricated compressor intermediate case.

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 1
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

- S.B.71-3641 - Harness to Suit S.T.A. 103 Amplifier.
- S.B.75-3594 - Deletion of Zone 1 vent inlet valve.
- S.B.72-3732 - Electrical harness re-routed through L.P. comp. case support ('A' frame).
- S.B.78-3753 - Introduction of Positive Indication of a Stowed and Locked Translating Cowl.
- S.B.71-4023 - Screening of S.T.A. 103 to prevent radio interference.
- S.B.73-4024 - Introduction of H.F. filter unit to prevent radio interference.
- S.B.71-4176 - General services category 2 loom assembly modified to suit fuel flow regulator calibration 'V'.
- R S.B.77-4644 - Vibration indication system, re-positioned vibration transducer.
- R S.B.78-4705 - Thrust reverser stowed sensor harness with reduced vulnerability to surge voltage.
- S.B.77-5387 - Introduction of a revised vibration monitoring system.
- S.B.71-5474 - H.P.3 left-hand bleed valve switching function interchange with minimum F/N solenoid release.
- S.B.71-5514 - Electrical harness - light duty loom C1/C2 Fire detector end fittings without 10 ohm resistor.
- R S.B.73-7620 - Introduction of an improved Lucas N2 speed limiter SCA200.
- R S.B.72-8138 - Installation of additional No.7 fire sensor and rail assembly
- R

EFFECTIVITY: ALL

050B

2A

71-50-00

Page 2

Nov 15/87



RB.211 Propulsion System

MAINTENANCE

2. Description

The engine electrical harnesses, located in zones 412, 422 and 432, serve the engine mounted units and the fire and overheat detection systems. On engines incorporating A.I.D.S., the engine electrical harness serves the A.I.D.S. units. The nose cowl harness interconnects nose cowl systems on wing mounted engines, to the engine electrical harness.

Each harness incorporates several looms and each loom is built up of fireproofed, fluid and abrasion resistant cables that are accommodated in a connector or terminals at the unit end.

The cables are cleated together with ties and are secured to the engine with clamps at regular intervals. To provide additional protection from damage due to heat or abrasion, the cables are protected by metal conduit or plastic wrap at specific positions.

R On engines incorporating S.B.71-3117, 'drip loops' are introduced in the cable runs, to prevent possible failure of the electrical contacts due to the ingress of fluids.

A wire identification code system is marked on sleeves positioned at the cable ends.

To allow interconnection between certain looms, intermediate disconnect points, consisting of multi-pin connectors, are provided in the interservices fairing and nose cowl areas.

The main looms terminate in multi-pin connectors at the engine/airframe interface disconnect. These interface connectors have letter or letter/number symbols, e.g. E, C1. To simplify identification, certain looms are referred to by these symbols, e.g. loom E, loom C1, instead of by their full titles.

All the connectors are of the self-locking, ratchet type and those at the engine/airframe interface and also at the intermediate disconnects are fireproofed.

A multi-terminal, master junction block (Ref. para.E) is positioned on the upper L.H. side of the L.P. compressor case. It provides interconnection within the engine systems, connects engine systems to test connectors and also provides the categorized earth bussing arrangements.

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 3
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

On engines incorporating S.B.78-3753, a reverser stowed junction block is positioned on the forward, upper, L.H. side of the L.P. compressor case. The junction block incorporates a module block having an encapsulated resistor/diode assembly and letter identified terminal positions. This junction block provides interconnection between the thrust reverser stowed proximity sensor and the engine electrical harness.

The looms are interchangeable between engines. Connectors that are not used on installation, e.g. No.2 hydraulic pump solenoid connector on wing engines, are positioned in stowage receptacles provided.

A. Engine Light Duty Electrical Harness

The harness located in zones 412, 422 and 432, interconnects the engine indicating, control and test systems to the aircraft systems.

The harness comprises the following looms:

- Essential services (Q1)
- Forward core engine (gas generator) speed probes
- Engine control services (G)
- Engine test services
- Engine test services and speed governor (S.B.71-3641)
- Engine openwire general services cat.2 (E)
- Engine openwire branched general services cat.4 (H)
- Pylon/fan case (pylon/L.P. compressor case) to splitter (interservices fairing) break (C1, C2 and T)
- Forward core engine (gas generator) services
- Splitter/pod (interservices fairing/propulsion system) services

The position of the loom disconnect points and the unit nomenclature to which they connect are illustrated in fig.1 to 4.

R EFFECTIVITY: ALL

R
050B

2A

71-50-00
Page 4
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

B. Nose Cowl Light Duty Electrical Harness (Engines No.1 and 3)

The harness, located in zones 410 and 420, connects the units in the nose cowl to the aircraft systems.

The harness comprises the following looms:

- Anti-icing
- Ventilation and pressure switches
- Fire bottles (Q2)
- Interphone

The position of the loom disconnect points and the unit nomenclature to which they connect are illustrated in fig.5. The looms connect the nose cowl units and, with the exception of the fire bottle loom, terminate at three intermediate disconnects on the left-hand side of the nose cowl rear diaphragm. The fire bottle loom is taken directly to the engine/airframe interface disconnect.

C. Engine Fire and Overheat Detection Harness

The harness, located in zones 412, 422 and 432, connects the engine fire and overheat detection systems to the aircraft systems.

The harness, located in two separate areas on the engine, comprises the following looms:

- Fire detection and zone overheat services (D1 and D2)
- Zone 4a to splitter (interservices fairing) fire detection
- Zone 2 fire detection hook-up

The position of the loom disconnect points and the unit nomenclature to which they connect are illustrated in fig.1 to 4.

The fire and zone overheat loom on the L.P. compressor case and the Zone 4a to splitter and Zone 2 fire detection looms at the rear of the gas generator, are interconnected by loom C1, C2 and T.

On engines incorporating S.B.71-2833, two resistors are introduced in each of the fire detection system loops to assist in fault location.

R EFFECTIVITY: ALL

R

050B

2A

71-50-00

Page 5

Nov 15/81



RB.211 Propulsion System

MAINTENANCE

D. A.I.D.S. Light Duty Electrical Harness

The harness, located in zones 412, 422 and 432, connects the engine A.I.D.S. transducers and thermocouples to the aircraft system.

The harness comprises the following looms:

LT openwire fancase to splitter (L.P. compressor case to interservices fairing) (M)
Temperature sensor

The position of the loom disconnect points and the unit nomenclature to which they connect are illustrated in fig.1 to 4. The harness cables for the Zone 2 A.I.D.S. terminate at the intermediate disconnect in the interservices fairing (splitter). The cables from the disconnect to the compressor delivery air temperature thermocouples are an integral part of the thermocouples.

E. Multi-terminal, Master Junction (Matrix) Block

The junction block (Ref. fig.6) is positioned on the L.H. side of the L.P. compressor case and comprises ten, double-sided, removeable module blocks. Each block has eight terminal positions on each side. The blocks are arranged in two rows of five separated by a centre plate having the numbers 1 to 20 on each side. The module blocks are retained horizontally by four end blocks having the letters A, B, C, D on one side and E, F, G, H on the other side, and vertically by a top plate.

Each letter on the end blocks is aligned with a horizontal row of terminal positions and each number on the centre plate is aligned with a vertical row of terminal positions. This provides individual identification of each terminal position, e.g. 1A, 10C, 19F, etc.

R
R

050B

EFFECTIVITY: ALL

2A

71-50-00

Page 6
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

The identification letters are arranged so that A is backed by E, B by F, C by G and D by H. The identification numbers are arranged so that 1 is backed by 1, 2 by 2, through to 20. Therefore terminal position 1A is backed and connected to 1E, etc.

In addition to each individual terminal position being connected internally to the one that directly backs it, they can also be connected internally, both vertically and horizontally, to form groups of terminal positions from 2 to 8. This allows separate circuits to be connected to a single source. For example, with reference to fig.6, if a power supply was connected to 20F it could be connected through terminal positions 19F, 19B and 20B to three separate units. The arrangement of this internal connection (bussing) is shown by a line drawn on each face of the module blocks.

Module blocks can be connected externally by link wires. Sealing plugs are fitted in unused terminal contact positions.

When connecting a terminal contact wire to a module block, a special double-ended tool is used. The wire is positioned in the tool and then both are entered into the terminal position. The spring retention clip is expanded and the terminal contact is guided into the floating socket. As the tool is withdrawn the springs on the retention clip lock behind a shoulder on the terminal contact to retain it in place. To extract a terminal contact wire, the tool is positioned on the wire and as the tool is entered into the terminal position it expands the spring retention clip to release the terminal contact and the tool and the wire are then withdrawn together.

R
R

EFFECTIVITY: ALL

050B

2A

71-50-00

Page 7

Nov 15/81



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

R
R
0508

EFFECTIVITY: ALL

2A

71-50-00
Page 8
Feb 15/79



RB.211 Propulsion System

MAINTENANCE

<u>Item</u>	<u>Unit</u>	<u>Loom</u>	<u>Wiring diagram fig.ref.</u>
ENGINE L.D. ELECTRICAL HARNESS			
1	Hyd. pump sol. (1 off-No.1 and 3 eng.)	Q1	13 (Sheet 1)
	Hyd. pump sol. (2 off-No.2 eng.)	Q1	13 (Sheet 1)
2	Oil filter press. differential switch	E	10
3	Oil L.P. warning switch	H	9
4	Oil press. transmitter	E	10
5	Oil quan. transmitter	H	8
6	Fine scav. oil filter press. differential switch	E	10
R 7	Intermediate disconnect- interphone	H	9
8	Intermediate disconnect- thermal anti-icing (TAI)	E	12
9	Intermediate disconnect- essential services	Q1	13
10	Intermediate disconnect - T/R lock removed proximity sensor (S.B.78-3282)	C1	18
11	Fuel flow transmitter	H	9
12	S.F.F.R. enrichment sol.	E	11
13	P4/PF switch	E	11
14	Fuel pump variable restrictor actuator	-	15
R 15	H.P. fuel shut-off valve	C2	20
16	Fuel enrichment solenoid	E	11
17	F.F.R. min. VMO stop sol.	E	11
18	F.F.R. ground idle reset solenoid	E	11
19	H.P. compressor bleed valve control unit solenoid	E	11
20	Fuel temp. bulb	H	8
21	Fuel L.P. warning switch	H	8
22	Fuel filter press. differential valve	H	8
R 23	Press. reg. and shut-off valve	C2	20

Key to Fig.1

EFFECTIVITY: ALL

0508

2A

71-50-00

Page 9

Nov 15/87



RB.211 Propulsion System

MAINTENANCE

<u>Item</u>	<u>Unit</u>	<u>Loom</u>	<u>Wiring diagram fig.ref.</u>
24	Oil temp. bulb	H	8
25	H.P. tacho. generator	G	14
33	Vibration transducer Compressor, Pre S.B.72-3310	T	9
34	Vibration transducer - Compressor, S.B.77-4644	T	9
<u>FIRE DETECTION AND OVERHEAT HARNESS</u>			
R 26	Differential expansion switches	C2	20
R 27 28	) No.4 and No.5 combustion) detector hook-up harness	D1,D2	21
<u>A.I.D.S. HARNESS</u>			
R 29	H.P. turbine temp. thermocouple	M	24
R 30	I.P. turbine temp. thermocouple	M	24
31	T7 thermocouples	T7 test	17
R 32	Throttle angle transducer	M	24

Key to Fig.1

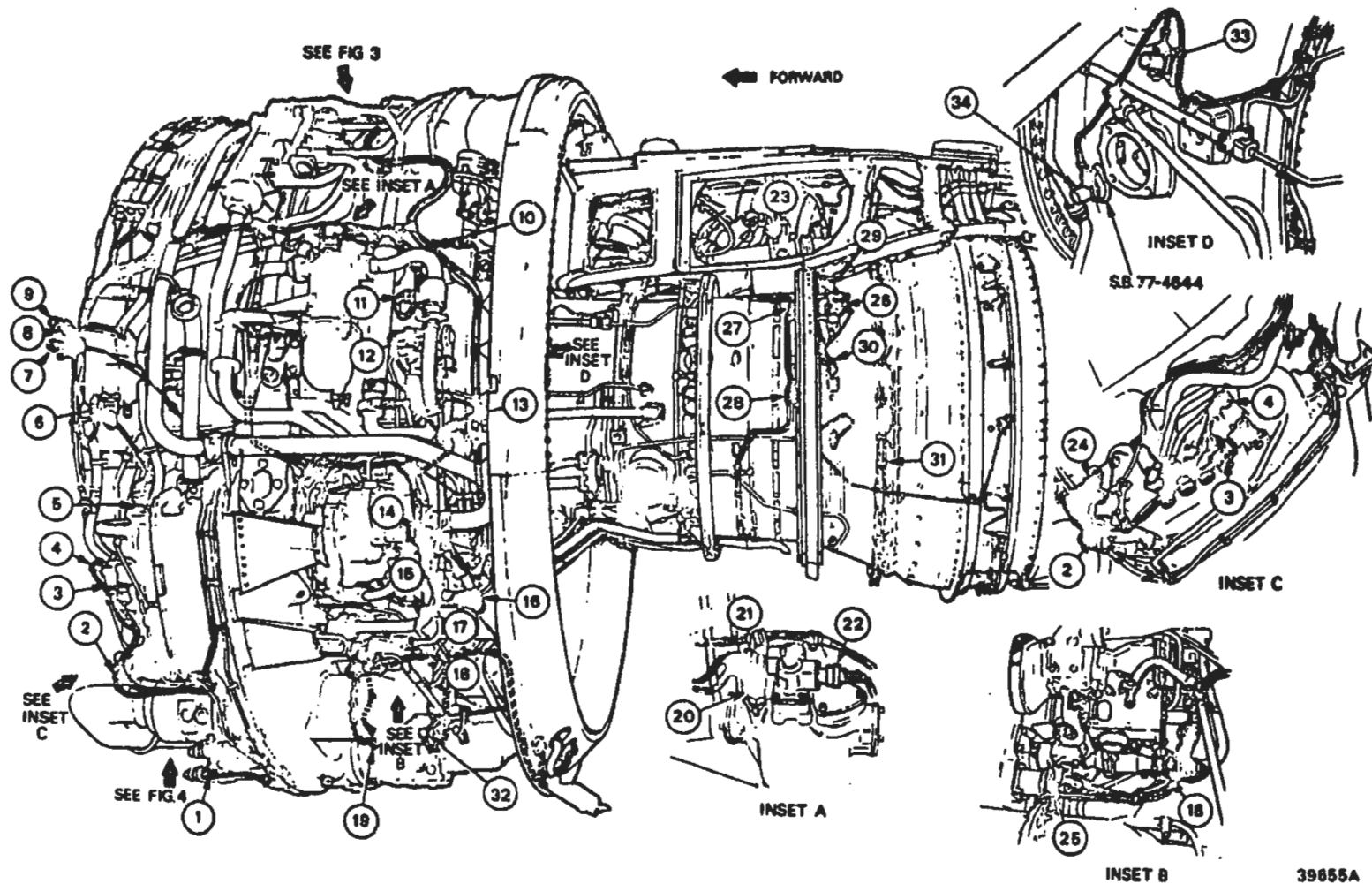
EFFECTIVITY: ALL

050B

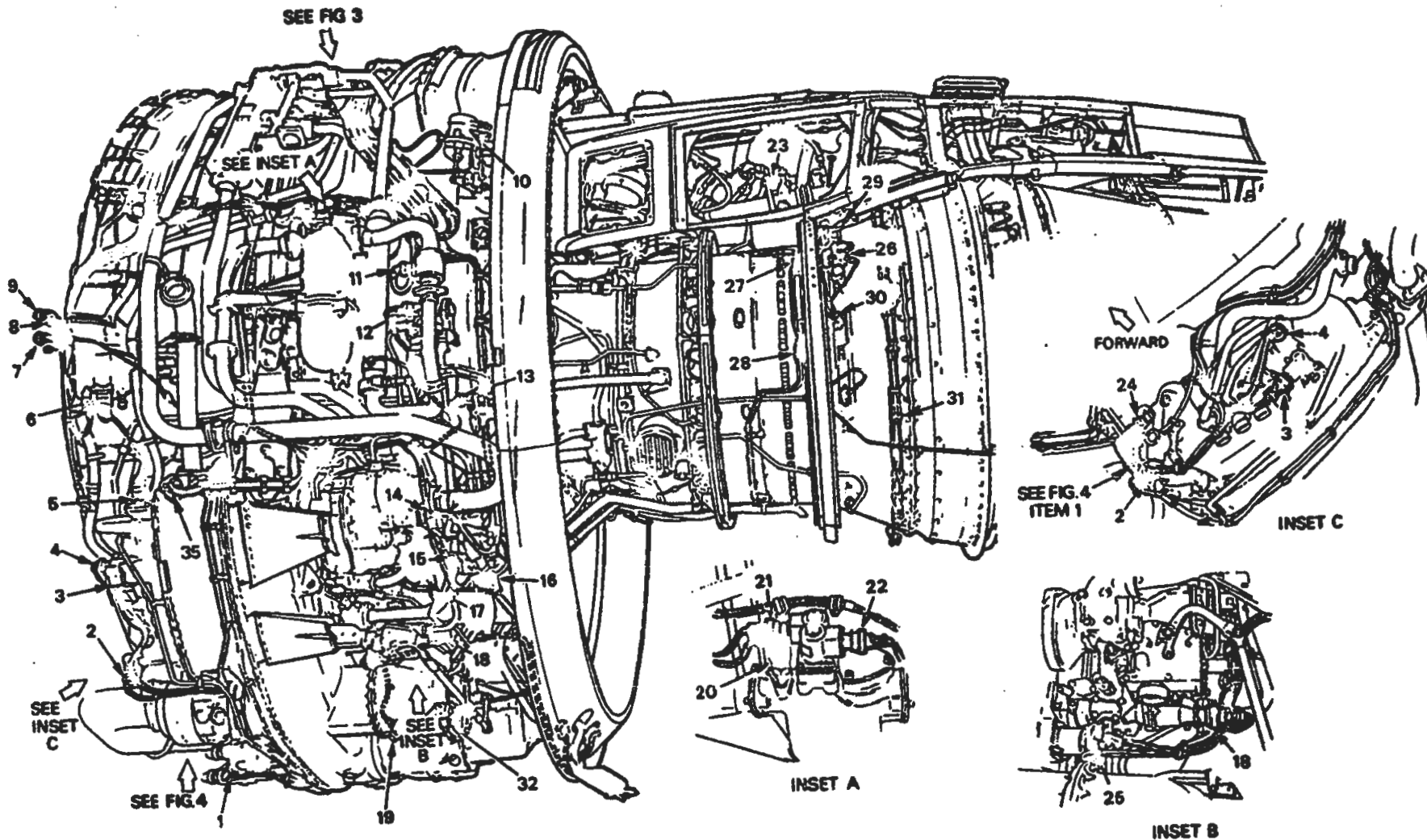
2A

71-50-00

Page 10
Nov 15/87



External view of electrical harness and connectors - Engine
L.H. side (Pre and S.B.77-2071, Pre S.B.72-3732 and S.B.77-4644)
Fig.1 (Sheet 1)



External view of electrical harness and connectors
(Pre and S.B.77-2071, S.B.72-3732)
Fig.1 (Sheet 2)

325880

R
R
R

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 13/14
Nov 15/89



RB.211 Propulsion System

MAINTENANCE

<u>Item</u>	<u>Unit</u>	<u>Loom</u>	<u>Wiring diagram fig.ref.</u>
<u>ENGINE L.D. HARNESS</u>			
1	Starter control valve	E	12
2	I.E.P.R. transmitter	C1	17
3	I.E.P.R. trimmer unit	C1	17
4	H.P. (Hi stage) valve controller	G	14
6	Interservices fairing disconnect-forward core eng. services (Pre S.B.72-3732)	C1	18
7	Interservices fairing disconnect-vibration transducer (compressor) (Pre S.B.72-3732)	T	9
R 8	H.P. (Hi stage) valve	C2	20
R 9	Interservices fairing disconnect-power plant	C1,C2	18, 20
10	Interservices fairing disconnect-vibration transducer (turbine) (Pre S.B.72-3732)	T	9 (Sheet 1)
11	Interservices fairing disconnect-T.G.T. (T7) thermocouples	C1	17
12	V.I.G.V. ram position indicator	-	18
13	Intermediate disconnect- speed probes	C1	19
14	I.P. speed probe	C1	19
15	L.P. speed probe	C1	19
16	Intermediate disconnect - T/R extend prox. switch sensor (S.B.78-3282)	C1	18
28	Vibration transducer - Compressor (S.B.72-3310)	T	9
29	Vibration transducer - Turbine (Pre S.B.77-4644)	T	9
30	Vibration transducer Compressor (S.B.77-4644)	T	9
30A	Vibration transducer - Compressor - (S.B.77-5387)	T	9
31	Vibration transducers junction boxes (S.B.77-5387)	T	9

Key to Fig.2

EFFECTIVITY: ALL

0508

2A

71-50-00

Page 15
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

<u>Item</u>	<u>Unit</u>	<u>Loom</u>	<u>Wiring diagram fig.ref.</u>
<u>FIRE AND OVERHEAT DETECTION HARNESS</u>			
R 16A	Fire detection-No.4 detector	D1,D2	21
R 17	Fire detection-No.3 detector	D1,D2	21
R 18	Interservices fairing disconnect-fire and O/H (loop B) (Pre S.B.72-3732)	D1,D2	21
R 19	Interservices fairing disconnect-fire and O/H (loop A) (Pre S.B.72-3732)	D1,D2	21
R 20	Zone 3 overheat sensor	D1,D2	21
R 21	Fire detection-No.2 detector	D1,D2	21
<u>A.I.D.S. HARNESS</u>			
R 22	Interservices fairing disconnect - A.I.D.S. Zone 2	M	24
R 23	Interservices fairing disconnect - A.I.D.S. Zone 3/4a	M	24
R 24	Splitter temp. sensor	M	24 (Sheet 2)
R 25	I.P. comp. delivery press. transducer	M	23
R 26	L.P. comp. delivery press. transducer	M	23
R 27	H.P. comp. delivery press. transducer	M	23

Key to Fig.2

EFFECTIVITY: ALL

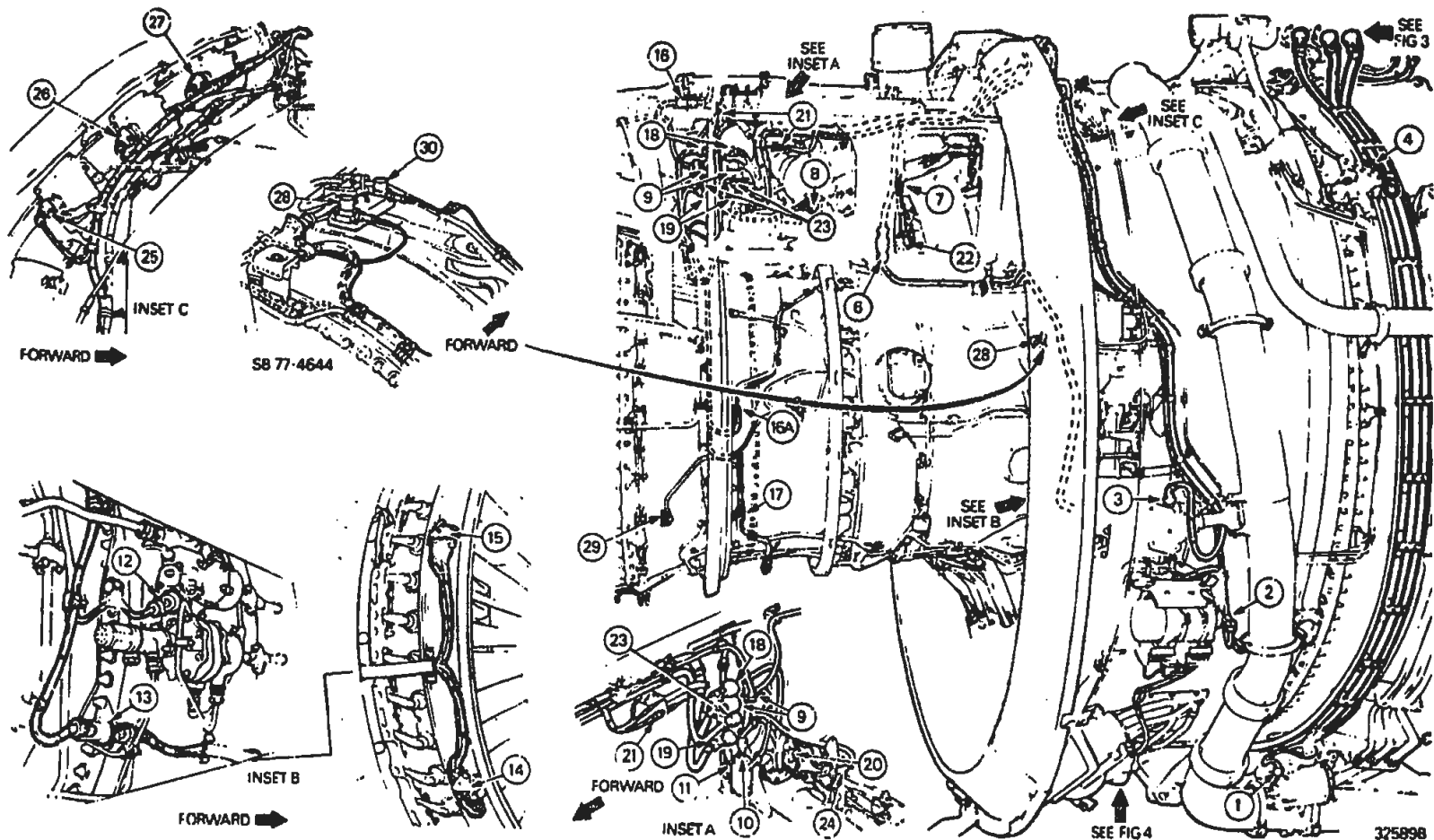
050B

2A

71-50-00

Page 16
Nov 15/87

RB.211 Propulsion System
MAINTENANCE



External view of electrical harness and connectors - Engine
 R.H. side (Pre and S.B.77-2071, S.B.72-3310, Pre S.B.72-3732 and
 S.B.77-4644) Fig.2 (Sheet 1)

71-50-00
 Page 17/18
 Nov 15/87

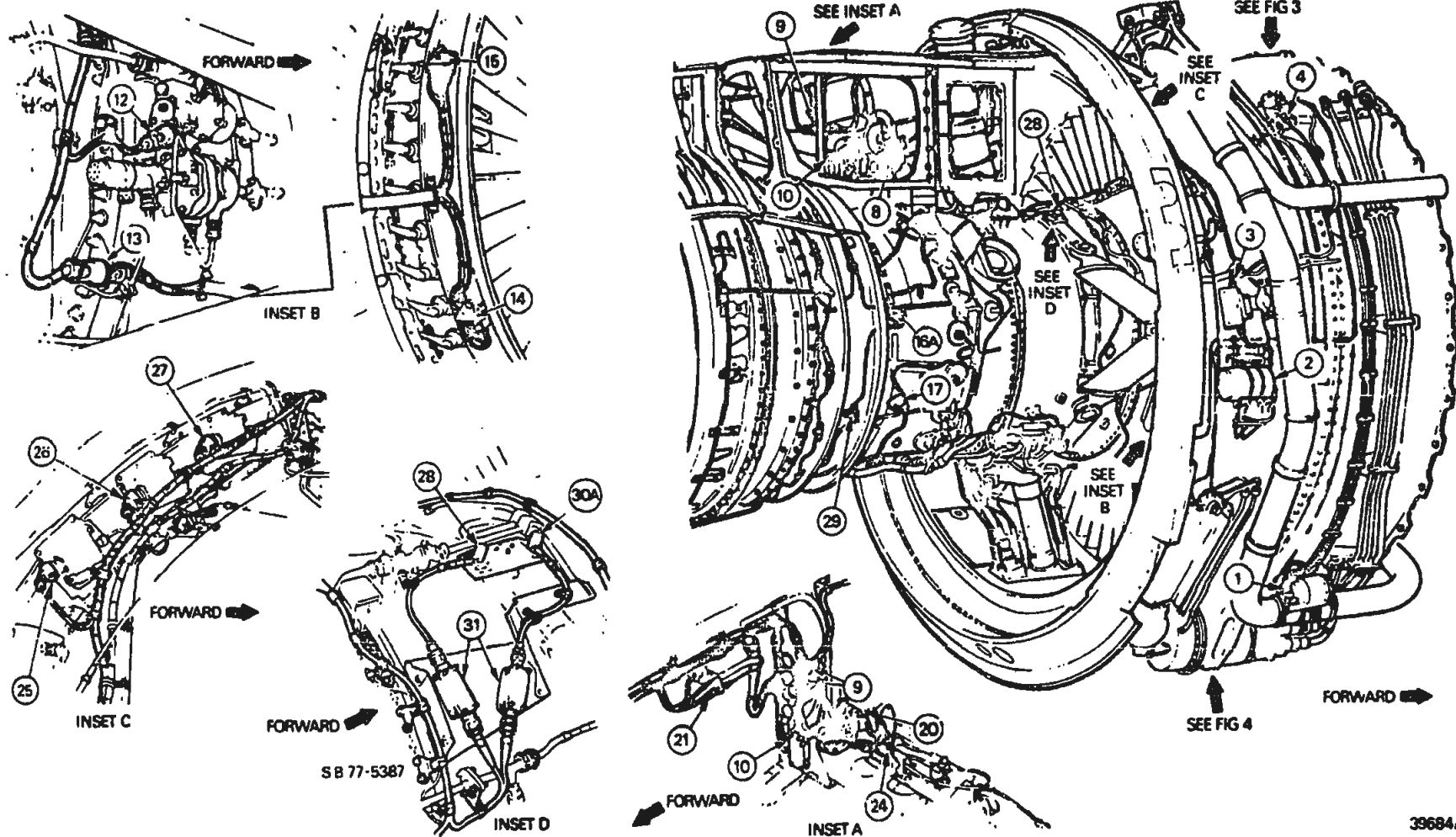
R EFFECTIVITY: ALL
 R
 050B

2A



RB.211 Propulsion System

MAINTENANCE



External view of electrical harness and connectors
Engine R.H. side (Pre and S.B.77-2071, S.B.72-3310, S.B.72-3732 and
S.B.77-5387) Fig.2 (Sheet 2)

R EFFECTIVITY: ALL
R
0508

2A

71-50-00
Page 19/20
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

<u>Item</u>	<u>Unit</u>	<u>Loom</u>	<u>Wiring diagram fig.ref</u>
<u>ENGINE L.D. ELECTRICAL HARNESS</u>			
1	Test receptacle - ENGINE TEST	-	16
2	Test receptacle - T7	-	17
3	Test receptacle - 115V/400Hz	-	15
4	Master junction block	-	-
R 5	Not applicable		
6	Speed and temp. control amplifier - plug 3	G	15
6A	H.F. filter unit (S.B.73-4024)	G	15
7	Speed and temp. control amplifier - plug 2	-	16
R 8	Not applicable		
9	Speed and temp. control amp. - T.G.T. (T7) terminals	-	17
9A	Reverser stowed junction block (S.B.78-3753)	-	18 (Sheets 2 and 3)
10	H.E. ignition unit No.1 (System B)	G	14
11	H.E. ignition unit No.2 (System A)	G	14
11A	Intermediate disconnect - T/R stowed prox. sensor (S.B.78-3753)	-	18 (Sheets 2 and 3)
12	Intermediate disconnect - T/R pressure switch	C1	18 (Sheets 2 and 3)
13	T/R selector valve sol.	C1	17
<u>FIRE AND OVERHEAT DETECTION HARNESS</u>			
R 14	Intermediate disconnect - Zone 3 O/H (Loop A)	D1,D2	21
R 15	Intermediate disconnect - Zone 3 O/H (Loop B)	D1,D2	21
R 16 17	) Fire detection-No.1 detector)	D1,D2	21

Key to Fig.3

EFFECTIVITY: ALL

050B

2A

71-50-00

Page 21
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

<u>Item</u>	<u>Unit</u>	<u>Loom</u>	<u>Wiring diagram fig.ref.</u>
<u>ENGINE/AIRFRAME INTERFACE PLUGS</u>			
18	Plug E	E	10, 11, 12
19	Plug Q1	Q1	13
20	Plug G	G	14, 15
21	Plug H	H	8, 9
22	Plug Q2	Q2	13 (Sheets 2 and 3)
R 23	Plug D2	D2	21
R 24	Plug D1	D1	21
25	Plug C1	C1	17, 18, 19
R 26	Plug P	P	22
R 27	Plug S	S	22
R 28	Plug A	A	22
29	Plug T	T	9
R 30	Plug C2	C2	20
R 31	Plug M	M	23, 24

Key to Fig.3

EFFECTIVITY: ALL

050B

71-50-00

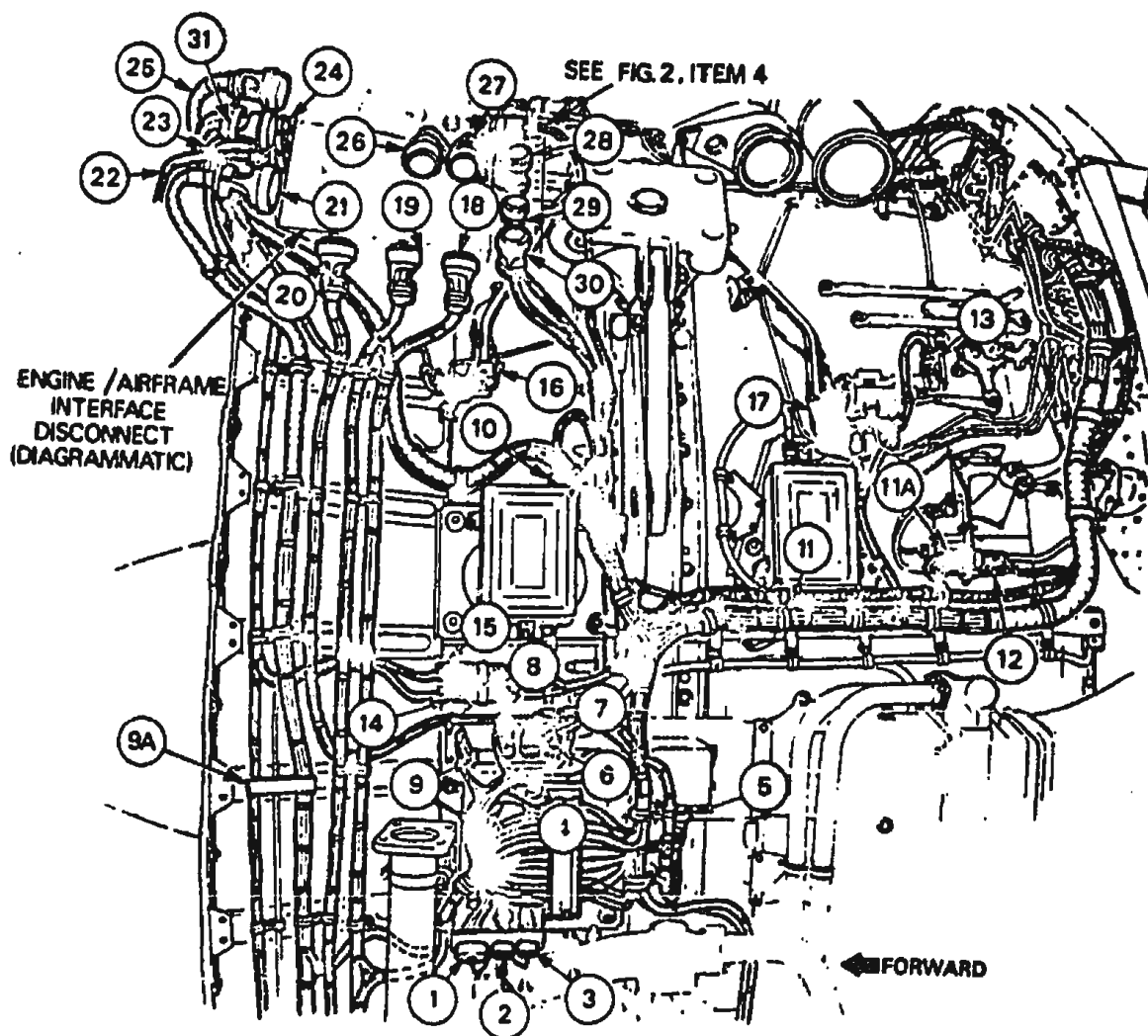
Page 22
Nov 15/87

2A



RB.211 Propulsion System

MAINTENANCE



32590

External view of electrical harness and connectors
- Engine front mount area (Pre and S.B.77-2071 and Pre S.B.72-3732)
Fig.3 (Sheet 1)

R EFFECTIVITY: ALL

R
050B

2A

71-50-00

Page 23
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

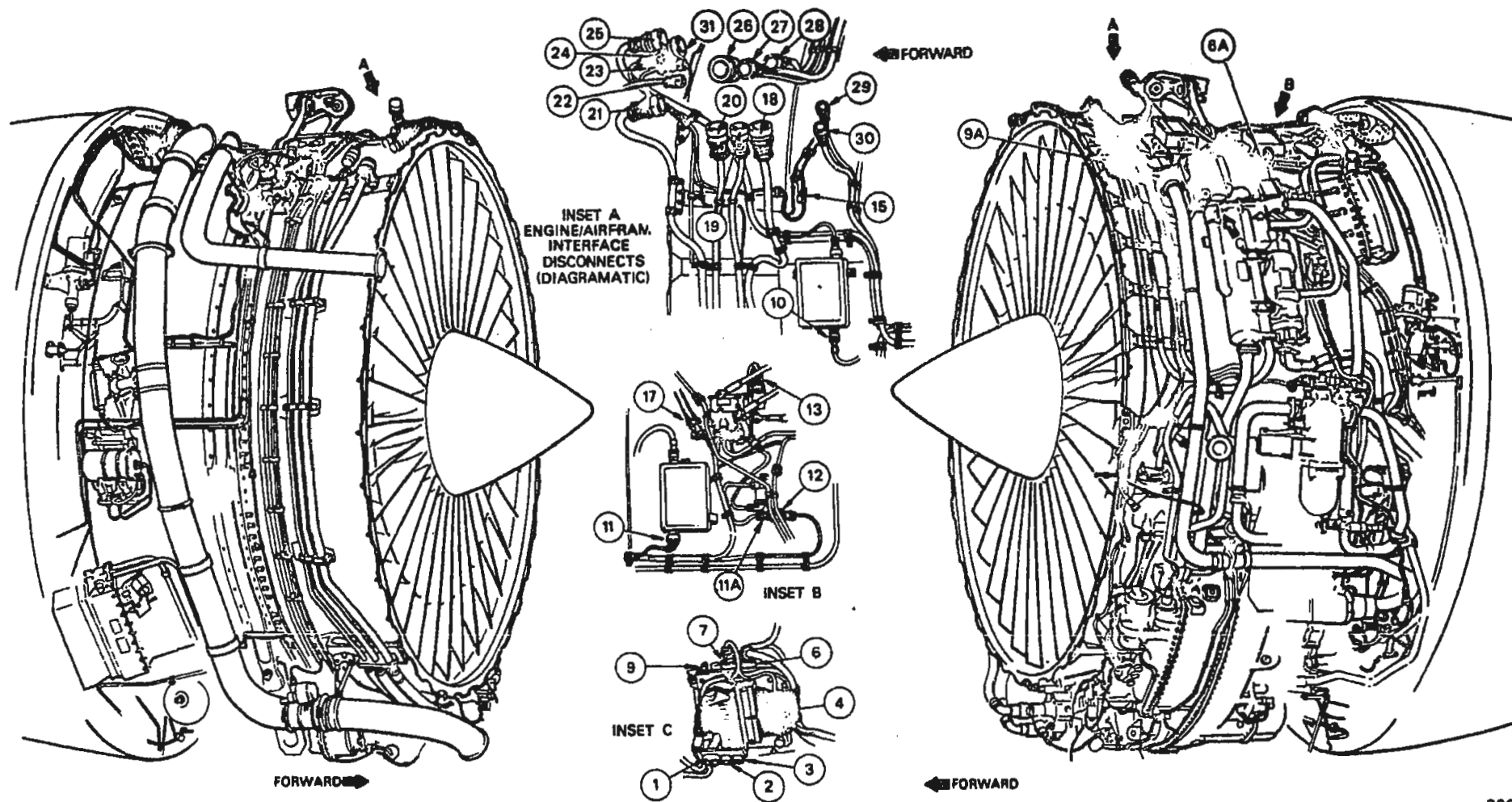
This page left blank intentionally

R
R
050B

EFFECTIVITY: ALL

2A

71-50-00
Page 24
May 15/86



39685

External view of electrical harness and connectors
- Engine front mount area (Pre and S.B.77-2071 and S.B.72-3732)
Fig.3 (Sheet 2)



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

R
R
050B

EFFECTIVITY: ALL

2A

71-50-00

Page 27
Feb 15/79



RB.211 Propulsion System

MAINTENANCE

<u>Item</u>	<u>Unit</u>	<u>Loom</u>	<u>Wiring diagram fig.ref</u>
<u>FIRE AND OVERHEAT DETECTION HARNESS</u>			
R 1 2	) Fire detection-No.6 detector)	D1,D2	21
R 3 4	) Fire detection-No.5 detector)	D1,D2	21
<u>A.C. GENERATION HARNESS</u>			
R 5	Terminal block	S,P	22
R 6	I.D.G. control services	A	22
<u>A.I.D.S. HARNESS</u>			
R 7	H.P. fuel differential press. transducer	M	23

Key to Fig.4

EFFECTIVITY: ALL

050B

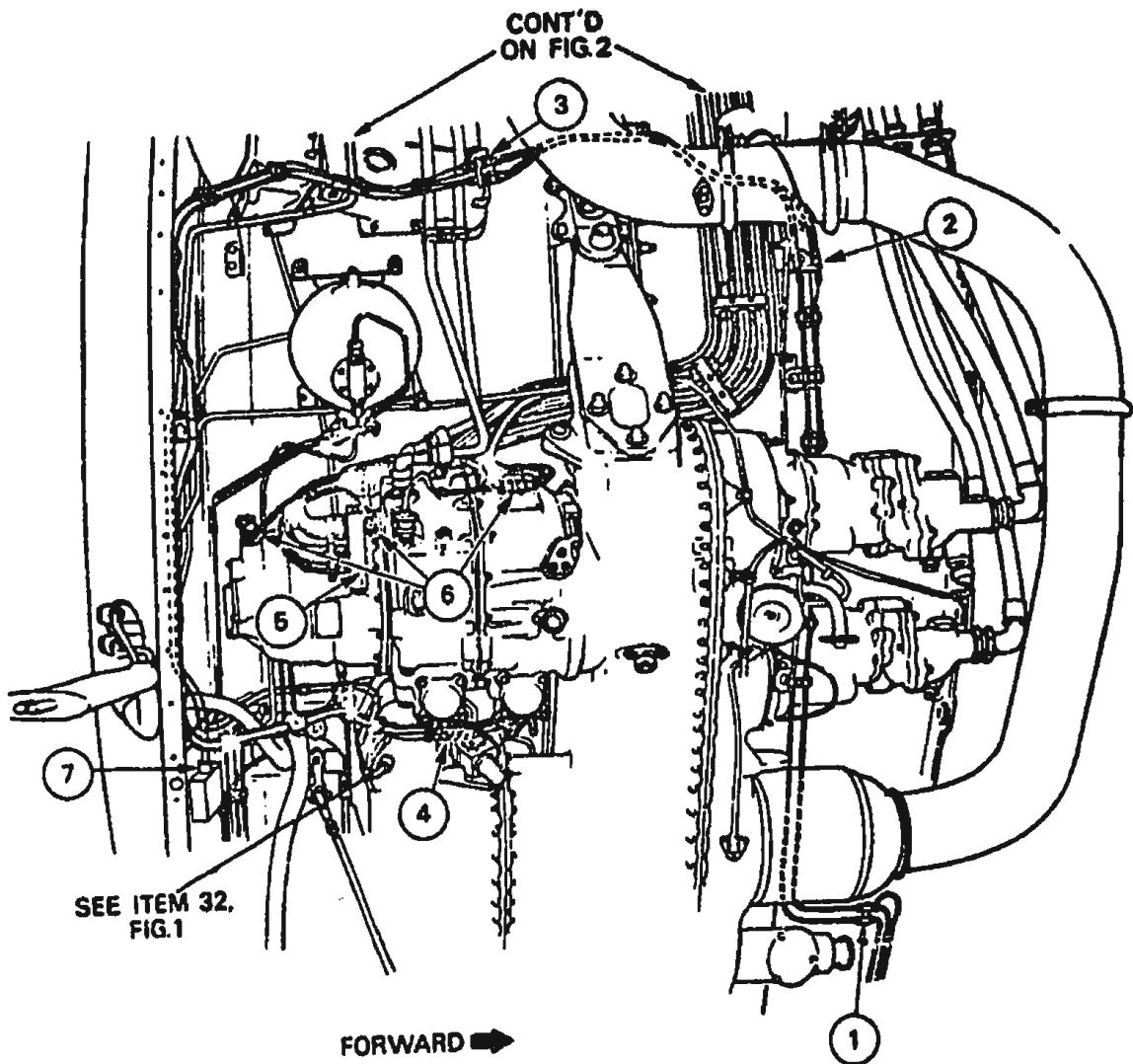
2A

71-50-00
Page 28
Nov 15/87



RB.211 Propulsion System

MAINTENANCE



32591

External view of electrical harness and connectors
- Engine I.D.G. area (Pre and S.B.77-2071)
Fig.4

R
R
050B

EFFECTIVITY: ALL

2A

71-50-00
Page 29
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

<u>Item</u>	<u>Unit</u>	<u>Loom</u>	<u>Wiring diagram fig.ref.</u>
<u>NOSE COWL L.D. ELECTRICAL HARNESS (ENG.No.1 AND 3)</u>			
1	Interphone jack point	H	9
2	Fire bottle (main discharge)	Q2	13
3	L.P. switch (main discharge)	Q1	(Sheets 2 and 3) 13
4	Fire bottle (alternate discharge)	Q2	(Sheets 2 and 3) 13
5	L.P. switch (alternate discharge)	Q1	(Sheets 2 and 3) 13
6	Intermediate disconnect- interphone	H	(Sheets 2 and 3) 9
7	Intermediate disconnect- thermal anti-icing (TAI)	E	12
8	Intermediate disconnect- essential services	Q1	13
9	Air inlet shut-off valve (Pre S.B.75-3594)	Q1	(Sheets 2 and 3) 13
10	Anti-icing press. reg. valve	E	12
11	Press. switch (H.P.)	E	12
12	Press. switch (L.P.)	E	12

Key to Fig.5

R
R
050B

EFFECTIVITY: ALL

2A

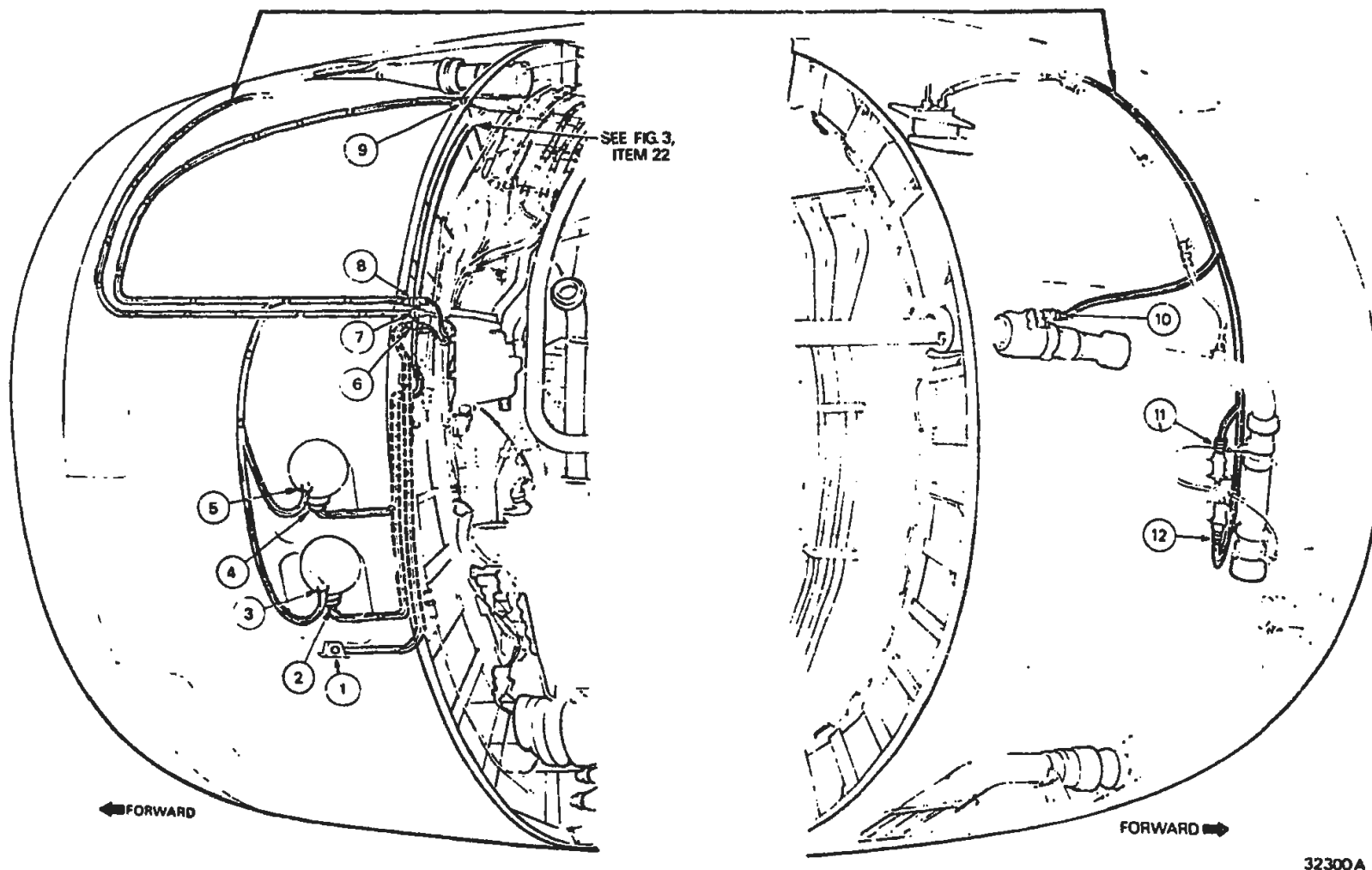
71-50-00

Page 30
Nov 15/87



RB.211 Propulsion System

MAINTENANCE



R
R

Electrical harness and connectors - Nose cowl (Eng 1 and 3)
Fig.5

EFFECTIVITY: ALL

6508

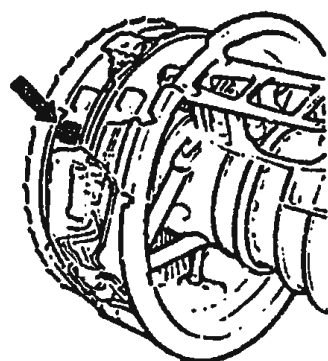
2A

71-50-00
Page 31/32
Feb 15/79

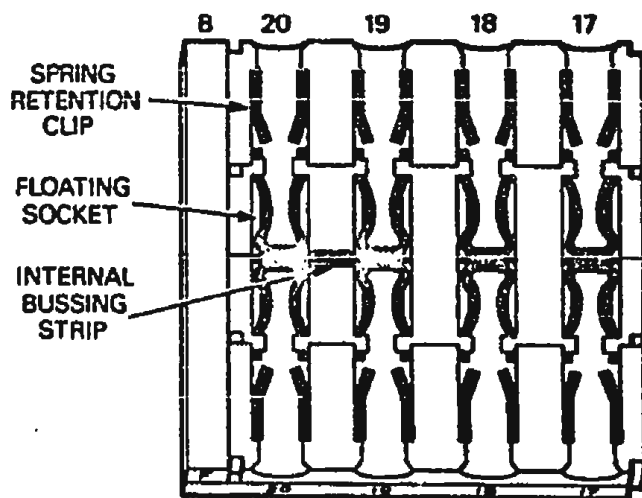
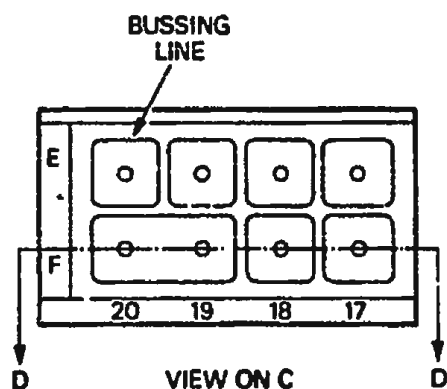
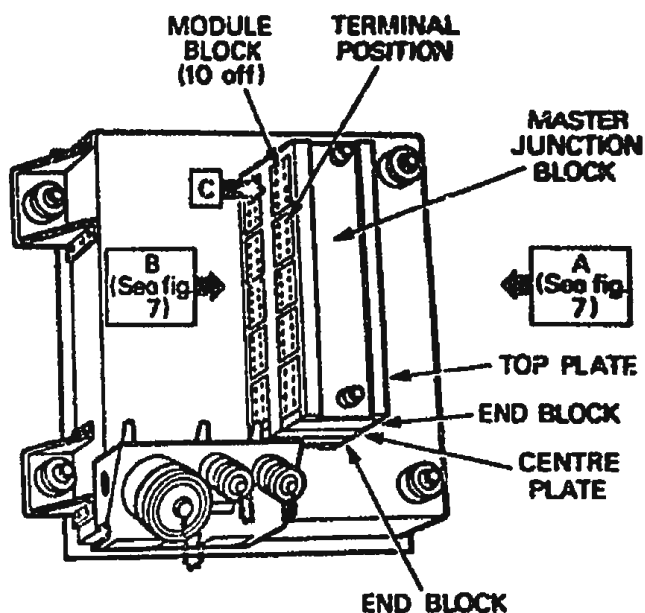


RB.211 Propulsion System

MAINTENANCE



← FORWARD



SECTION D D

32301

Multi-terminal master junction block
Fig. 6

R
R
0508

EFFECTIVITY: ALL

2A

71-50-00

Page 33
Feb 15/79



RB.211 Propulsion System

MAINTENANCE

S.B. 78-3753

A	T/R STOWED PROX. SENS. PIN 3	T/R EXTEND PROX. SENS. PIN 3	T/R PRESS. SW PIN 3	LOCK REMOVED PROX. SENS. PIN 3
	H.P. VALVE GROUND	H.P. VALVE CONT. PIN 3	I.E.P.R. TRANS. PIN 4	PLUG C1 PIN 32
B	1	2	3	4

39666

R
R
R

Junction block terminal reference and sealing plug positions
(terminal positions affected by S.B.78-3753)
Fig.7 (Sheet 1)

EFFECTIVITY: ALL

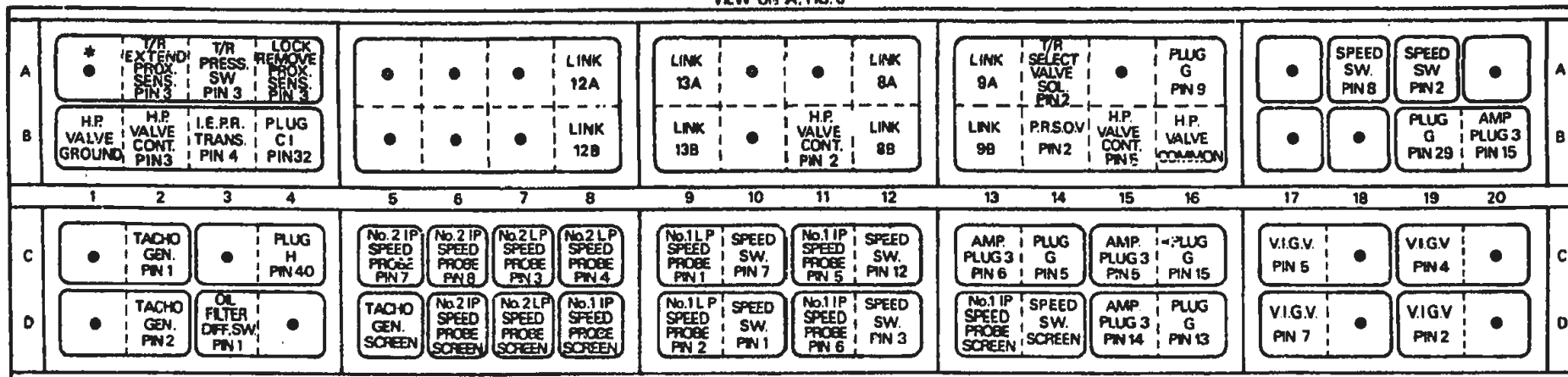
(1508

2A

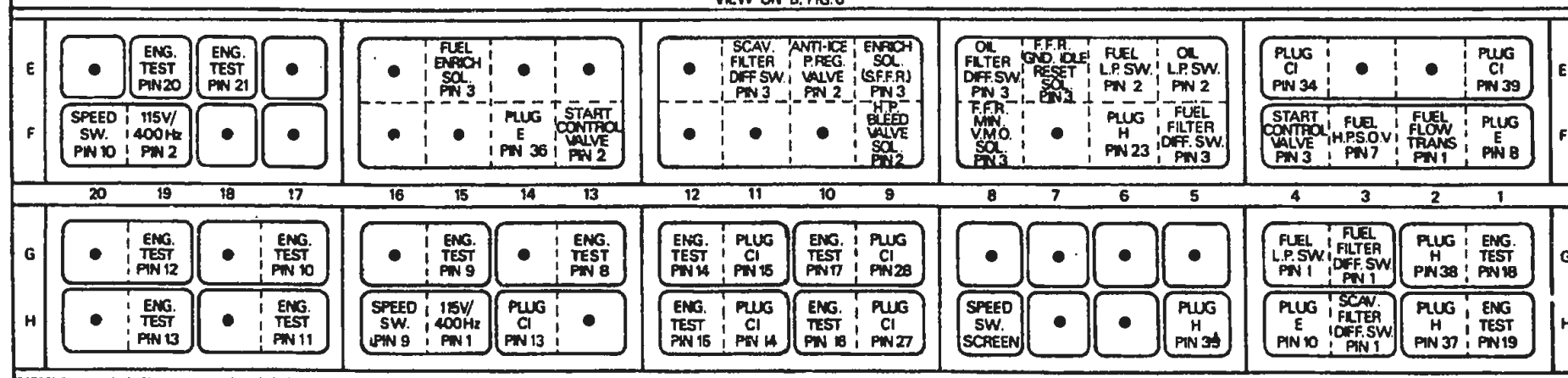
71-50-00

Page 34
Feb 15/79

VIEW ON A, FIG. 6



VIEW ON B, FIG. 6



NOTE. 1. Solid lines define the internal bussing arrangement of each module block. Dotted lines are included to define individual module block connections
2. Sealing plugs are fitted at positions indicated ●. * See Fig. 7, Sheet 1 for configuration affected by Service Bulletin

39667A

Junction block terminal reference and sealing plug positions
(Pre S.B.78-3753, Pre S.B.71-3641)
Fig.7 (Sheet 2)

71-50-00
Page 35/36
Nov 15/87

R EFFECTIVITY: ALL
R
0508

2A



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

R
R
0508

EFFECTIVITY: ALL

ZA

71-50-00

Page 37
Feb 15/79



RB.211 Propulsion System

MAINTENANCE

S.B. 78-3753

A	T/R STOWED PROX. SENS. PIN 3	T/R EXTEND PROX. SENS. PIN 3	T/R PRESS. SW PIN 3	LOCK REMOVED PROX. SENS. PIN 3
B	H.P. VALVE GROUND	H.P. VALVE CONT. PIN 3	I.E.P.R. TRANS. PIN 4	PLUG C1 PIN 32
	1	2	3	4

39666

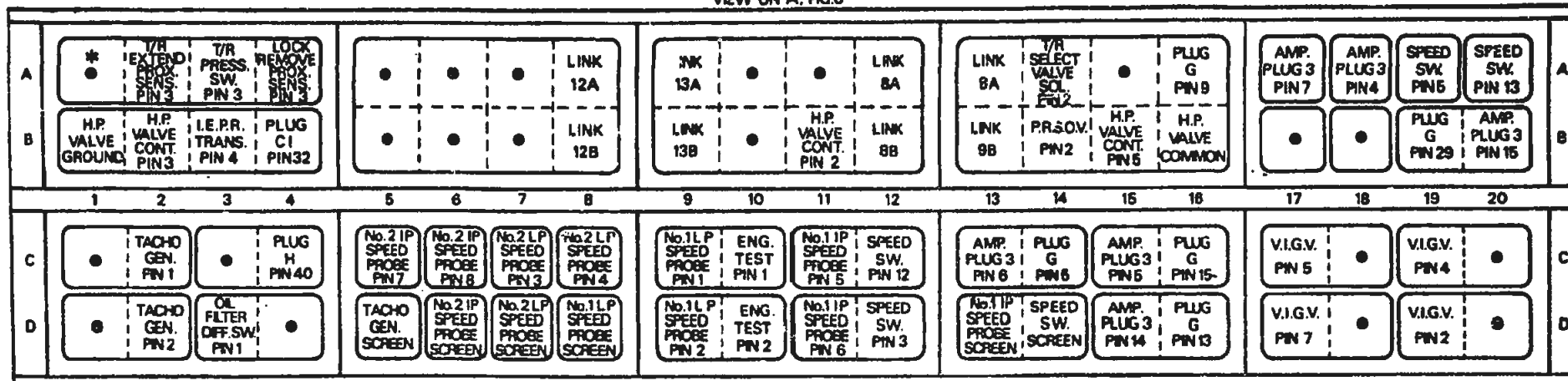
Junction block terminal reference and sealing plug positions
(terminal positions affected by S.B.78-3753)
Fig.7A (Sheet 1)

EFFECTIVITY: ALL

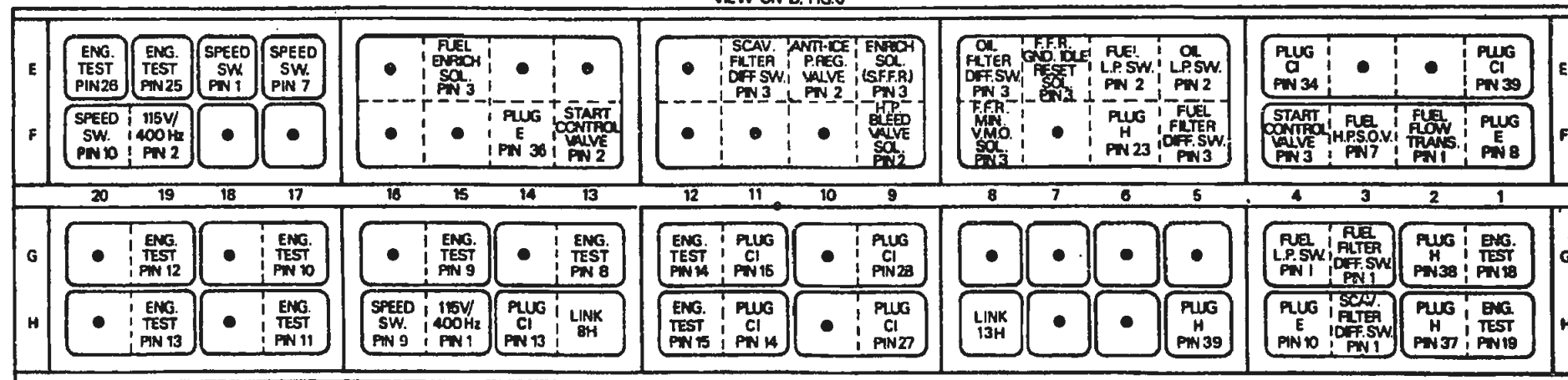
71-50-00
Page 38
Feb 15/79

2A

VIEW ON A, FIG.6



VIEW ON B, FIG.6



NOTE: 1. Solid lines define the internal bussing arrangement of each module block. Dotted lines are included to define individual module block connections
2. Sealing plugs are fitted at positions indicated ● * See Fig. 7A, Sheet 1 for configuration affected by Service Bulletin.

39668

Junction block terminal reference and sealing plug positions
(Pre S.B.78-3753, Pre S.B.71-3641)
Fig.7A (Sheet 2)

R EFFECTIVITY: ALL
R
050B

2A

71-50-00
Page 39/40
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally



RB.211 Propulsion System

MAINTENANCE

S.B. 78-3753

A	T/R STOWED PROX. SENS. PIN 3	T/R EXTEND PROX. SENS. PIN 3	T/R PRESS. SW PIN 3	LOCK REMOVED PROX. SENS. PIN 3
B	H.P. VALVE GROUND	H.P. VALVE CONT. PIN 3	I.E.P.R. TRANS. PIN 4	PLUG C1 PIN 32
	1	2	3	4

39666

Junction block terminal reference and sealing plug positions
(terminal positions affected by S.B.78-3753)
Fig.7B (Sheet 1)

EFFECTIVITY: ALL

71-50-00

Page 42
Feb 15/79

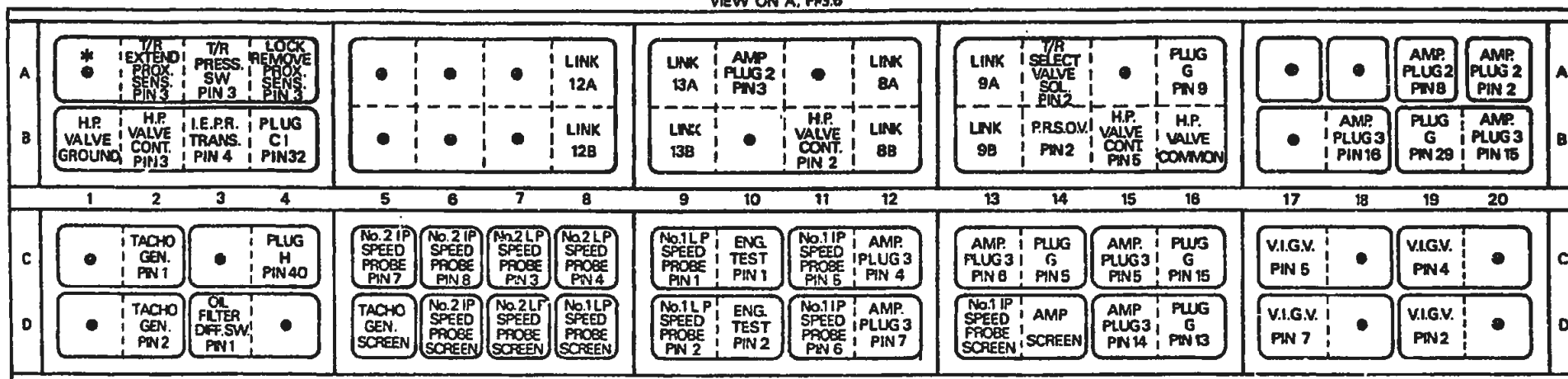
2A



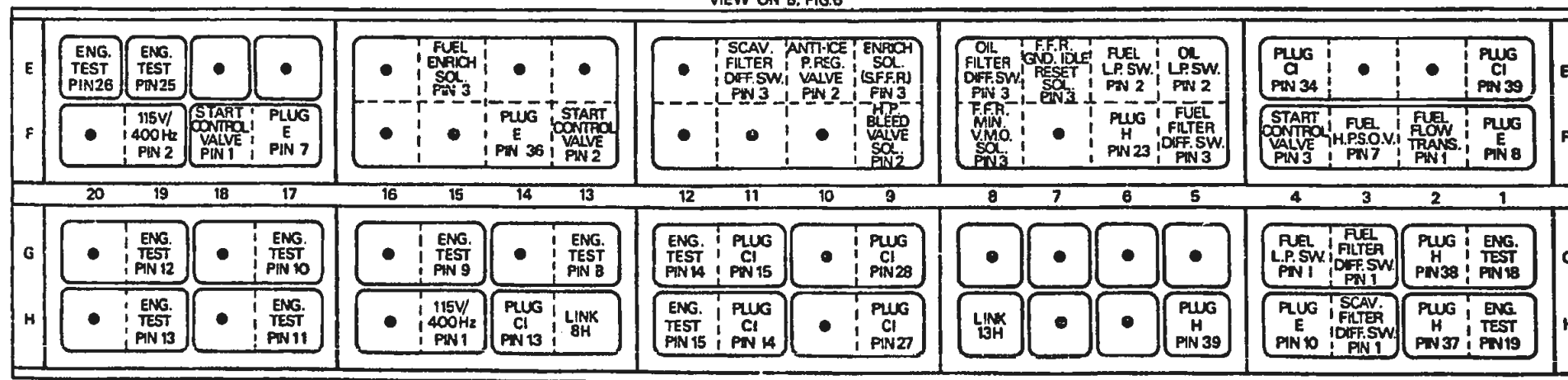
AB.211 Propulsion System

MAINTENANCE

VIEW ON A, FIG.8



VIEW ON B, FIG.8



NOTE: 1. Solid lines define the internal bussing arrangement of each module block. Dotted lines are included to define individual module block connections.
2. Sealing plugs are fitted at positions indicated ● * See Fig. 7B, Sheet 1 for configuration affected by Service Bulletin.

39559

R
R
R

Junction block terminal reference and sealing plug positions
(Pre S.B.78-3753, S.B.71-3641)
Fig.7B (Sheet 2)

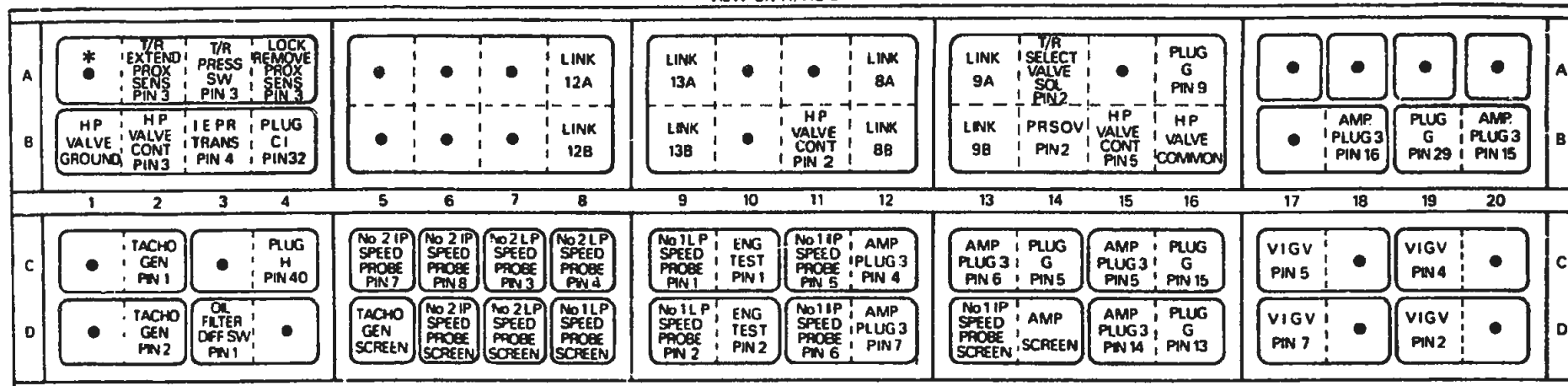
EFFECTIVITY: ALL

71-50-00
Page 43/44
Feb 15/79

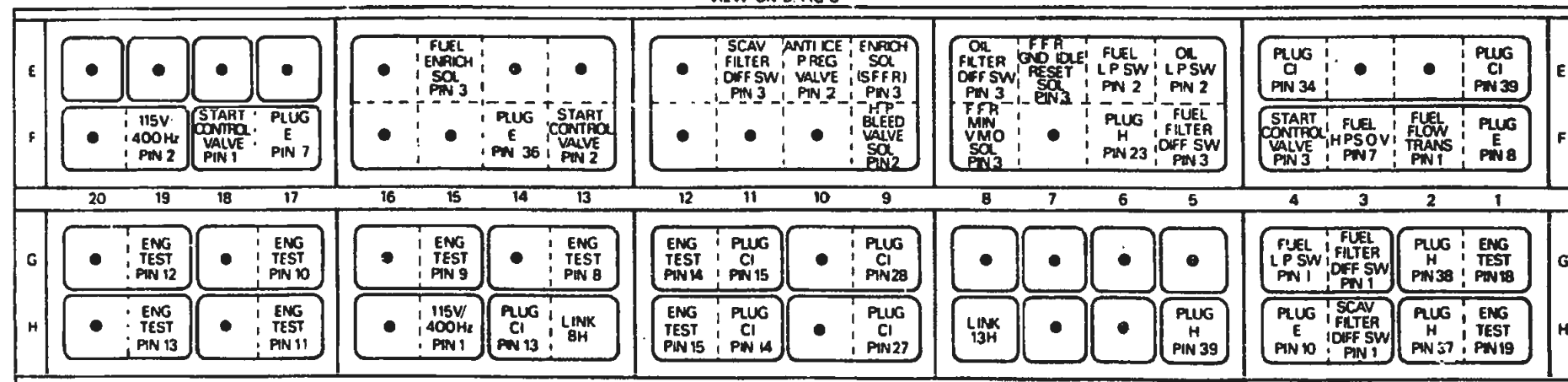
2A

(508)

VIEW ON A, FIG 6



VIEW ON B, FIG 6



NOTE 1 Solid lines define the internal bussing arrangement of each module block. Dotted lines are included to define individual module block connections.
2 Sealing plugs are fitted at positions indicated ● * See Fig 7B Sheet 1 for configuration affected by Service Bulletin

40256A

R Junction block terminal reference and sealing plug positions
R (Pre S.B.78-3753, S.B.71-3641 and S.B.73-4023)
R Fig.78 (Sheet 3)

EFFECTIVITY: ALL

71-50-00
Page 45/46
Nov 15/81



RB.211 Propulsion System

MAINTENANCE

Engine/airframe interface plug reference

Fig.No

R
R
R
R
R
R

Plug H	8, 9
Plug T	9
Plug Q1	13
Plug Q2	13 (Sheets 2 and 3)
Plug E	10, 11, 12
Plug G	14, 15
Plug C1	17, 18, 19
Plug C2	20
Plug D1	21
Plug D2	21
Plug M	23, 24
Plug P	22
Plug S	22
Plug A	22

Engine test receptacles

115V/400Hz	15
ENGINE TEST	16
T7	17

Plug references to wiring diagram figure numbers

EFFECTIVITY: ALL

050B

2A

71-50-00

Page 47
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

R Code	Identification
R 22FR-6	9811-P701 FR1
R 22FR-7	9811-P701 FR2
R 22FR-8	9811-P701 FR3
R 22H-1	7937-7002 A18 YEL
R 22H-2	7937-7000 A18 BLU
R 22H-6	7937-7001 A18 BLU
R 22H-7	7337-7002 A18
R 22H-9	7937-7001 A18 RED
R 22H-18	7337-7000 A18 RED
R 22H-19	7934-7002 A18
R 22H-23	7331-7000 A18
R 22H-23a	7331-7000 C18
R 22H-23b	7331-7000 B18
R 22H-35	7934-7001 A18 BLU
R 22H-36	7934-7000 A18 RED
R 22H-37a	7712-7001 B18 BLU
R 22H-38a	7712-7000 B18 RED
R 22H-39b	7712-7014 C18
R 22H-40	7331-7001 A18
R 22H-40a	7331-7001 C18
R 22H-40b	7331-7001 B18

Key to Fig.8

R EFFECTIVITY: ALL

050B

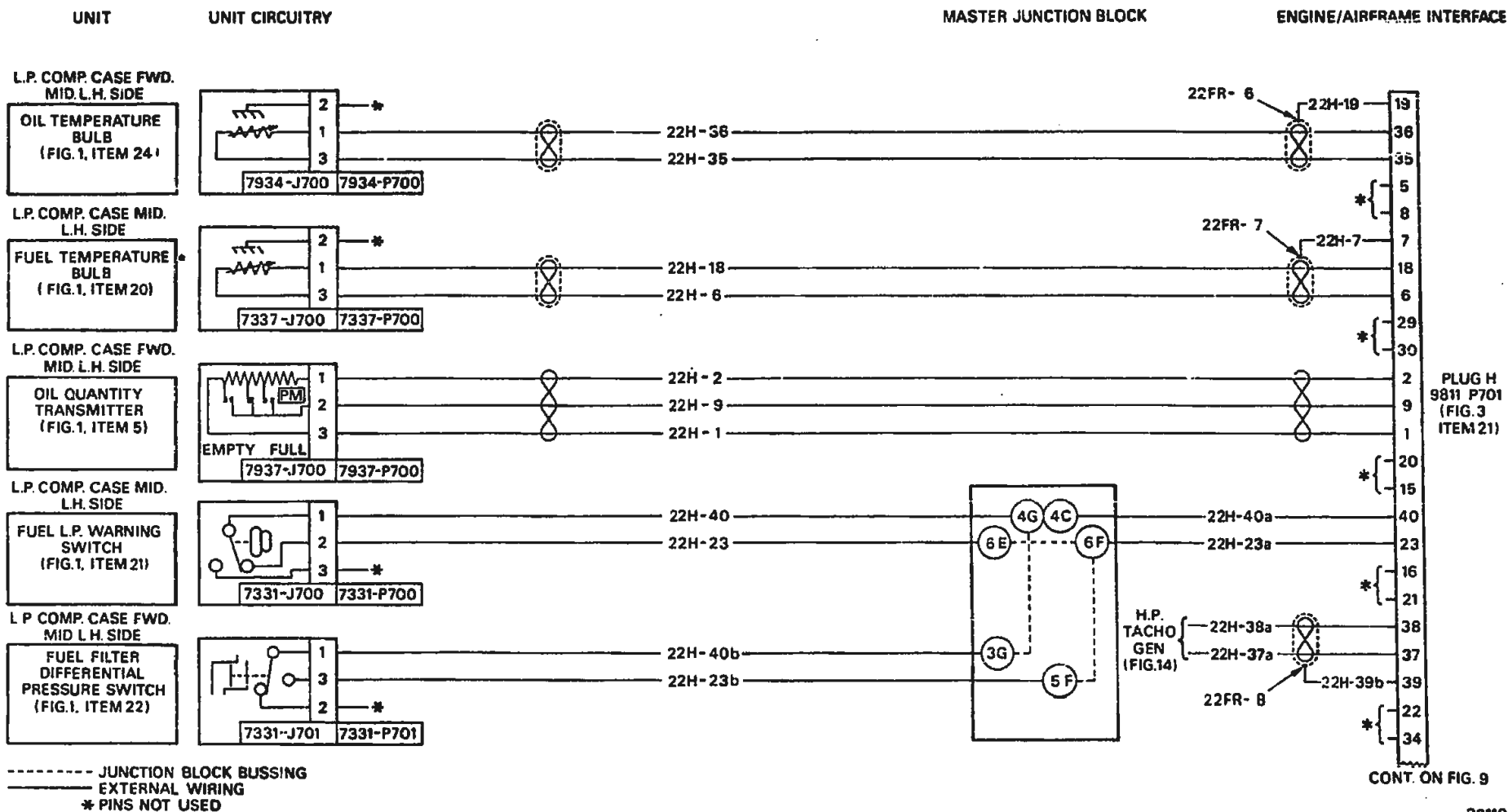
2A

71-50-00
Page 48
Feb 15/79



RB.211 Propulsion System

MAINTENANCE



CONT. ON FIG. 9

39119A

 R
R

 Propulsion system wiring diagram
Fig. 8

EFFECTIVITY: ALL

0508

2A

71-50-00

 Page 49/50
Feb 15/79



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

**R
R
050B**

EFFECTIVITY: ALL

2A

71-50-00

**Page 51
Feb 15/79**

**MAINTENANCE**

Code	Identification
22C1-32	7334-7002 A18
22-FR8	7334-P700 FR1
22-FR9	7334-P700 FR2
22-FR10	2343-J701 FR1
22-FR11	7731-MT700 FR1
22-FR12	7731-MT701 FR1
22-FR13	7731-TB700 FR2
22-FR14	7731-TB701 FR2
22-FR15	7731-TB700 FR1
22-FR16	7731-TB701 FR1
22-FR17	9811-P701 FR4
22-FR18	2343-P701 FR1
22-FR19	9811-P701 FR5
22-FR20	7731-P700 FR1
22-FR21	7731-P700 FR2
22H-3	7334-7001 A18 RED
22H-4	7334-7003 A18 RED
22H-10	7334-7000 A18 BLU
22H-13	7334-7007 A18
22H-14	7334-7004 A18 BLU
22H-17	2343-7003 A18
22H-17a	2343-7003 B18
22H-17b	2343-7003 C18
22H-25	7931-7000 A18
R 22H-27	7334-7005 A18 RED
R 22H-28	7334-7006 A18 BLU
22H-31	2343-7000 A18 YEL
22H-31a	2343-7000 B18 YEL
22H-32	2343-7001 A18 BLU
22H-32a	2343-7001 B18 BLU
22H-33	2343-7002 A18 RED
22H-33a	2343-7002 B18 RED
22E-36	7931-7001 A18
22T-1	7731-7000 A18 RED (Blue wire)
22T-1a	7731-7000 B18 RED (Blue wire)
22T-2	7731-7001 A18 BLU (White wire)
22T-2a	7731-7001 B18 BLU (White wire)
22T-3	7731-7004 A18 RED (Blue wire)
22T-3a	7731-7004 B18 RED (Blue wire)
22T-4	7731-7005 A18 BLU (White wire)
22T-4a	7731-7005 B18 BLU (White wire)
22T-5	7731-7003 A18
22T-10	7731-7002 A18

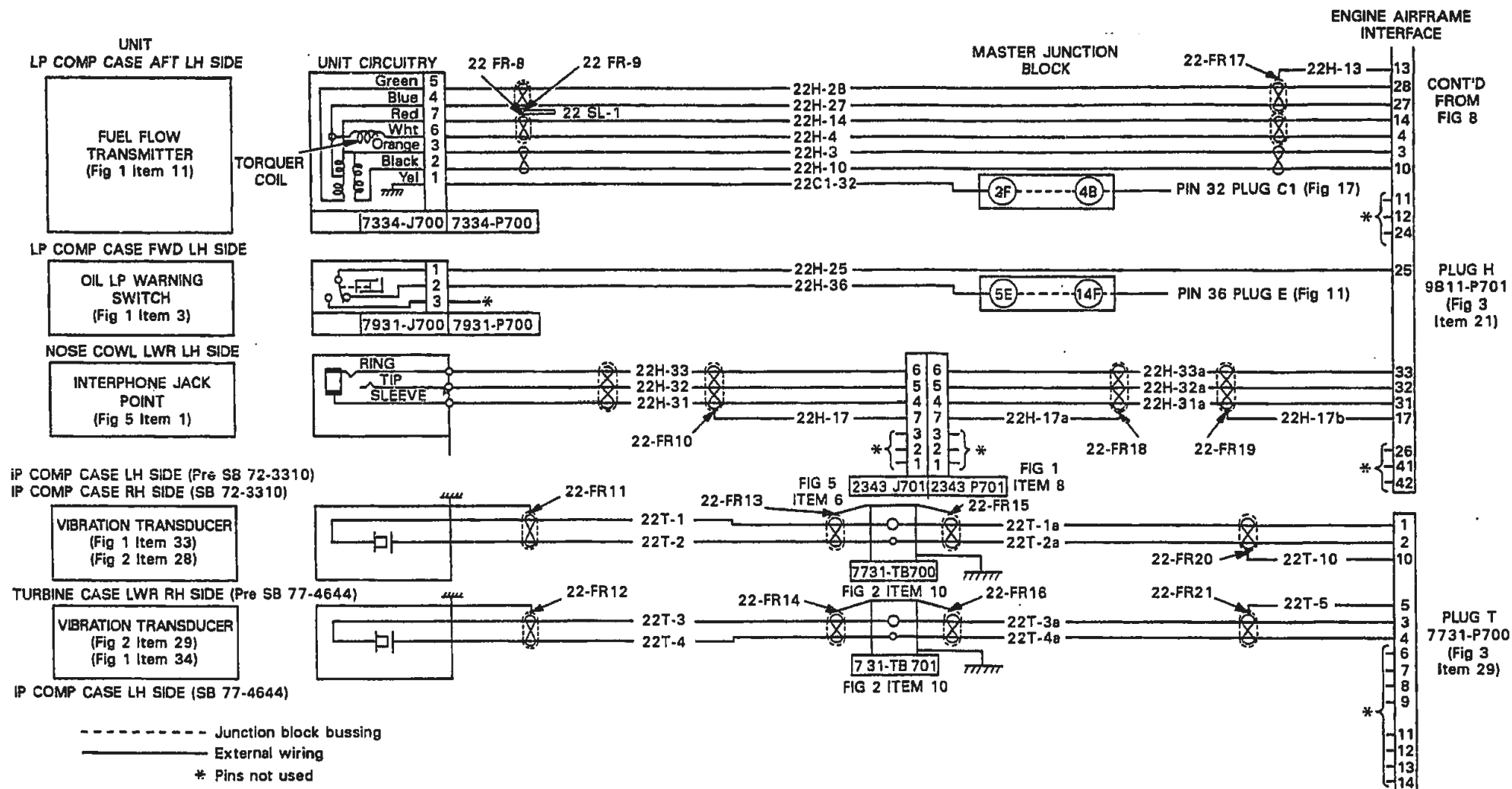
Key to Fig.9 (Sheet 1)

EFFECTIVITY: ALL



BB.211 Propulsion System

MAINTENANCE



Propulsion system wiring diagram (Pre S.B.72-3732
Pre and S.B.72-3310 and Pre and S.B.77-4644)
Fig.9 (Sheet 1)

EFFECTIVITY: ALL

2A

71-50-00
Page 53/54
Nov 15/89

39129E



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

R
R
050B

EFFECTIVITY: ALL

2A

71-50-00
Page 55
Feb 15/79



RB.211 Propulsion System

MAINTENANCE

Code	Identification
22C1-32	7334-7002 A18
22FR-8	7334-P700 FR1
22FR-9	7334-P700 FR2
22FR-10	2343-J701 FR1
22FR-11	7731-MT700 FR1
22FR-12	7731-MT701 FR1
22FR-13	7731-TB700 FR2
22FR-14	7731-TB701 FR2
22FR-15	7731-TB700 FR1
22FR-16	7731-TB701 FR1
22FR-17	9811-P701 FR4
22FR-18	2343-P701 FR1
22FR-19	9811-P701 FR5
22FR-20	7731-P700 FR1
22FR-21	7731-P700 FR2
22H-3	7334-7001 A18 RED
22H-4	7334-7003 A18 RED
22H-10	7334-7000 A18 BLU
22H-13	7334-7007 A18
22H-14	7334-7004 A18 BLU
22H-17	2343-7003 A18
22H-17a	2343-7003 B18
22H-17b	2343-7003 C18
22H-25	7931-7000 A18
R 22H-27	7334-7005 A18 RED
R 22H-28	7334-7006 A18 BLU
22H-31	2343-7000 A18 YEL
22H-31a	2343-7000 B18 YEL
22H-32	2343-7001 A18 BLU
22H-32a	2343-7001 B18 BLU
22H-33	2343-7002 A18 RED
22H-33a	2343-7002 B18 RED
22E-36	7931-7001 A18
22T-1	7731-7000 A18 RED (Blue wire)
22T-2	7731-7001 A18 BLU (white wire)
22T-3	7731-7004 A18 RED (Blue wire)
22T-4	7731-7005 A18 BLU (white wire)
22T-5	7731-7003 A18
22T-10	7731-7002 A18

Key to Fig.9 (Sheet 2)

EFFECTIVITY: ALL

050B

2A

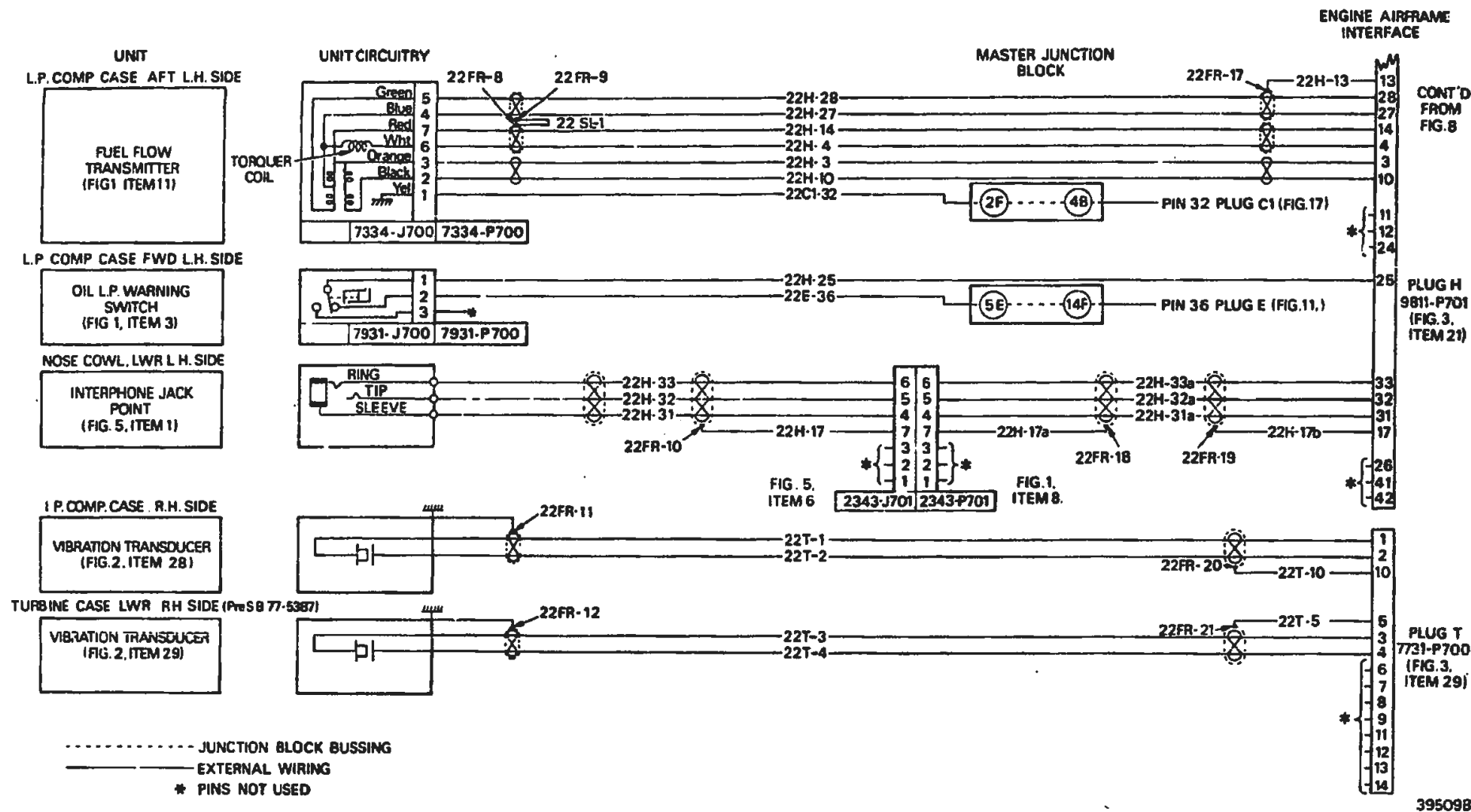
71-50-00

Page 56
Nov 15/87

**RB.211**

Propulsion System

MAINTENANCE



Propulsion system wiring diagram (S.B.72-3732 and
Pre S.B.77-5387)
Fig.9 (Sheet 2)

EFFECTIVITY: ALL

71-50-00Page 57/58
Nov 15/81

0508

2A



RB.211 Propulsion System

MAINTENANCE

R

This page left blank intentionally

050B

EFFECTIVITY: ALL

2A

71-50-00

Page 59
Nov 15/81



BB.211 Propulsion System

MAINTENANCE

Code	Identification
22C1-32	7334-7002 A18
22FR-8	7334-P700 FR1
22FR-9	7334-P700 FR2
22FR-10	2343-J701 FR1
22FR-11	7731-MT700 FR1
22FR-12	7731-MT701 FR1
22FR-13	7731-TB700 FR2
22FR-14	7731-TB701 FR2
22FR-15	7731-TB700 FR1
22FR-16	7731-TB701 FR1
22FR-17	9811-P701 FR4
22FR-18	2343-P701 FR1
22FR-19	9811-P701 FR5
22FR-20	7731-P700 FR1
22FR-21	7731-P700 FR2
22H-3	7334-7001 A18 RED
22H-4	7334-7003 A18 RED
22H-10	7334-7000 A18 BLU
22H-13	7334-7007 A18
22H-14	7334-7004 A18 BLU
22H-17	2343-7003 A18
22H-17a	2343-7003 B18
22H-17b	2343-7003 C18
22H-25	7931-7000 A18
R 22H-27	7334-7005 A18 RED
R 22H-28	7334-7006 A18 BLU
22H-31	2343-7000 A18 YEL
22H-31a	2343-7000 B18 YEL
22H-32	2343-7001 A18 BLU
22H-32a	2343-7001 B18 BLU
22H-33	2343-7002 A18 RED
22H-33a	2343-7002 B18 RED
22E-36	7931-7001 A18
22T-1	7731-7000 A18 BLU
22T-2	7731-7001 A18 WHT
22T-3	7731-7004 A18 BLU
22T-4	7731-7005 A18 WHT
22T-5	7731-7003 A18
22T-10	7731-7002 A18

Key to Fig.9 (Sheet 3)

EFFECTIVITY: ALL

050B

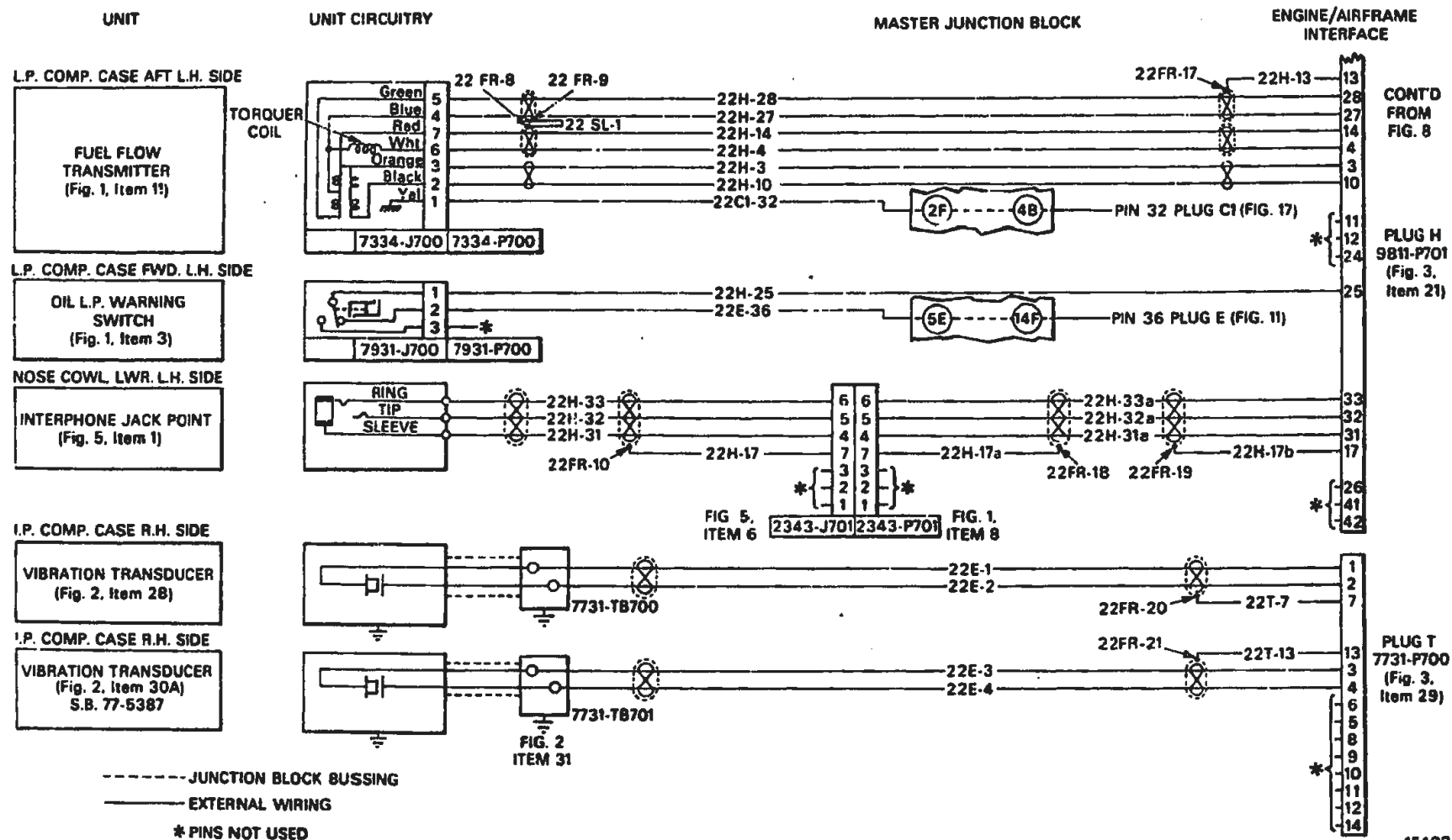
2A

71-50-00
Page 60
Nov 15/87

**RB.211**

Propulsion System

MAINTENANCE

Propulsion system wiring diagram (S.B.72-3732 S.B.77-5387)
Fig.9 (Sheet 3)

EFFECTIVITY: ALL

71-50-00

Page 61/62
Nov 15/81



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

R
R
OSOB

EFFECTIVITY: ALL

2A

71-50-00
Page 63
Feb 15/79



RB.211 Propulsion System

MAINTENANCE

Code	Identification
22E-10	7931-7002 B18
22E-10a	7931-7002 A18
22E-10b	7931-7002 C18
22E-15	7931-7004 A18 RED
22E-29	7931-7006 A18 YEL
22E-30	7931-7005 A18 BLU
22E-36g	7931-7003 B18
22E-36h	7931-7003 A18

Key to Fig.10

R
R
050B

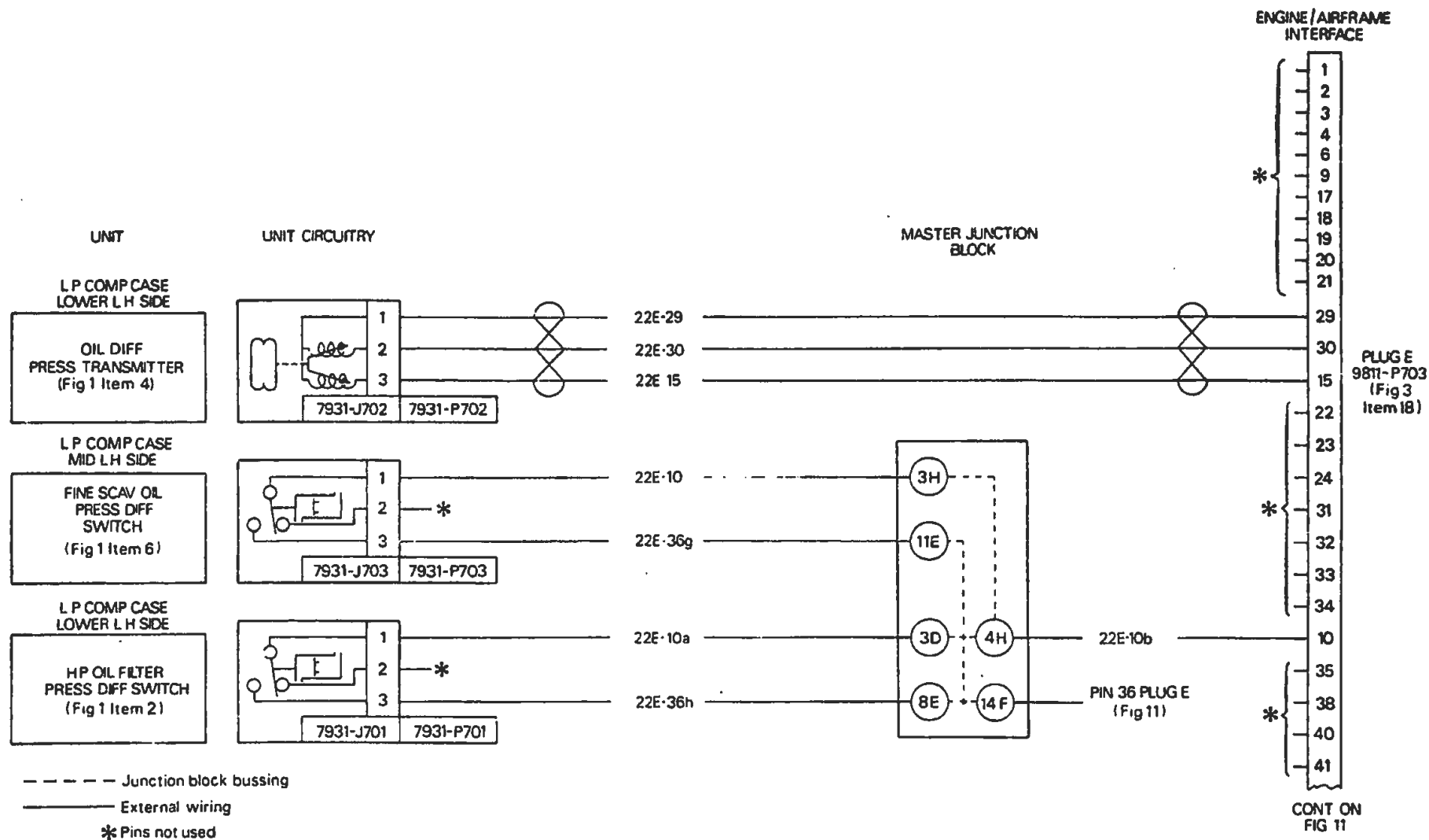
EFFECTIVITY: ALL

2A

71-50-00

Page 64
Nov 15/81

RB.211 Propulsion System
MAINTENANCE



Propulsion system wiring diagram
 Fig.10

71-50-00
 Page 65/66
 Nov 15/87

EFFECTIVITY: ALL

050B

2A

391308



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

R
R
0508

EFFECTIVITY: ALL

2A

71-50-00
Page 67
Feb 15/79



RB.211 Propulsion System

MAINTENANCE

Code	Identification
22E-16	8011-7012 A18
22E-25	7611-7000 A18
22E-26	7321-7027 A18
22E-27	7321-7000 A18
22E-28	7321-7003 C18
22E-36	7321-7001 B18
22E-36a	7321-7026 A18
22E-36b	7611-7001 A18
22E-36d	7321-7001 A18
22E-36e	7321-7002 A18
22E-36f	8011-7011 A18
22L-A	7321-7028 A18

Key to Fig.11 (Sheet 1)

R
R
0508

EFFECTIVITY: ALL

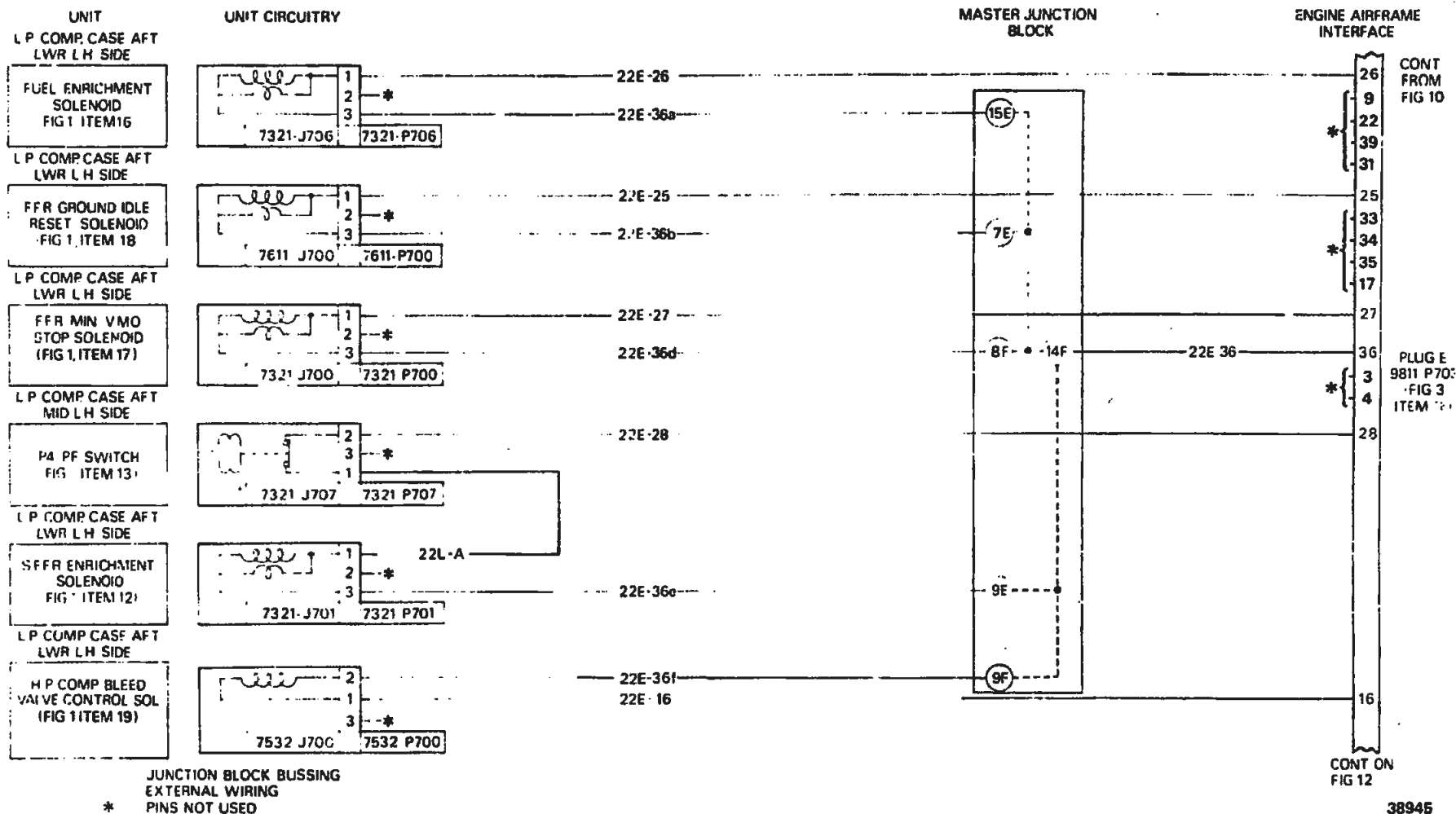
2A

71-50-00
Page 68
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



Propulsion system wiring diagram (Pre S.B.71-4176 and Pre S.B.71-5474)
Fig.11 (Sheet 1)

R R
050B EFFECTIVITY: ALL

2A

71-50-00
Page 69/70
Nov 15/81



RB.211 Propulsion System

MAINTENANCE

R

This page left blank intentionally

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 71
Nov 15/81



RB.211 Propulsion System

MAINTENANCE

Code	Identification
22E-16	7321-7058 A18
22E-25	7611-7000 A18
22E-26	7321-7027 A18
22E-27	7321-7000 A18
22E-28	7532-7003 C18
22E-36	7321-7001 B18
22E-36a	7321-7026 A18
22E-36b	7611-7001 A18
22E-36d	7321-7057 A18
22E-36e	7321-7002 A18
22E-36f	8011-7011 A18
22L-A	7532-7002 A18

Key to Fig.11 (Sheet 2)

R
R
050B

EFFECTIVITY: ALL

2A

71-50-00
Page 72
May 15/86



RB.211 Propulsion System **MAINTENANCE**

UNIT
L P COMP CASE AFT
LWR L H SIDE

FUEL ENRICHMENT
SOLENOID
(Fig 1, item 16)

L P COMP CASE AFT
LWR L H SIDE

FFR GROUND IDLE
RESET SOLENOID
(Fig 1, item 18)

L P COMP CASE AFT
LWR L H SIDE

FFR MIN VMO
STOP SOLENOID
(Fig 1, item 17)

L P COMP CASE AFT
MID L H SIDE

P4/PF SWITCH
(Fig 1, item 13)

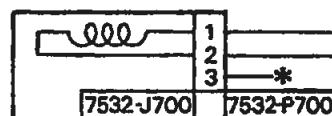
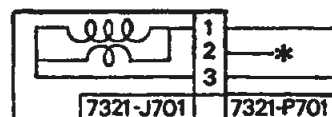
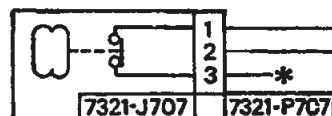
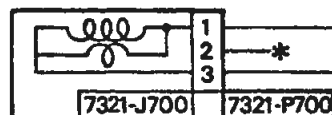
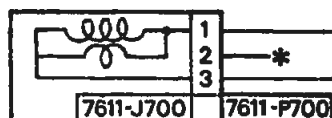
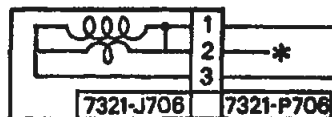
L P COMP CASE AFT
LWR L H SIDE

SFFR ENRICHMENT
SOLENOID
(Fig 1, item 12)

L P COMP CASE AFT
LWR L H SIDE

H P COMP BLEED
VALVE
CONTROL SOL
(Fig 1, item 19)

UNIT CIRCUITRY



MASTER JUNCTION BLOCK

ENGINE/AIRFRAME INTERFACE

----- Junction block bussing
 ----- External wiring
 * Pins not used

CONT
FROM
FIG 10

PLUG E
9811-P703
(Fig 3,
item 18)

CONT ON
FIG 12

45401A

R Propulsion system wiring diagram (Pre S.B.71-4176 and S.B.71-5474)
 R Fig.11 (Sheet 2)

EFFECTIVITY: ALL

050B

2A

71-50-00
 Page 73/74
 May 15/86



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

R
R
0508

EFFECTIVITY: ALL

2A

71-50-00
Page 75
Feb 15/79



RB.211 Propulsion System

MAINTENANCE

Code	Identification
22E-16	8011-7012 A18
22E-25	7611-7000 A18
22E-26	7321-7027 A18
22E-27	7321-7000 A18 (S.B.71-4176 Part 1)
22E-28	7321-7003 A18
22E-36a	7321-7026 A18
22E-36b	7321-7001 A18
22E-36c	7321-7001 A18
22E-36d	7321-7001 B18
22E-36e	7321-7002 A18
22E-36f	8011-7011 A18
22L-A	7321-7028 A18

R

Key to Fig.11 (Sheet 3)

EFFECTIVITY: ALL

050B

2A

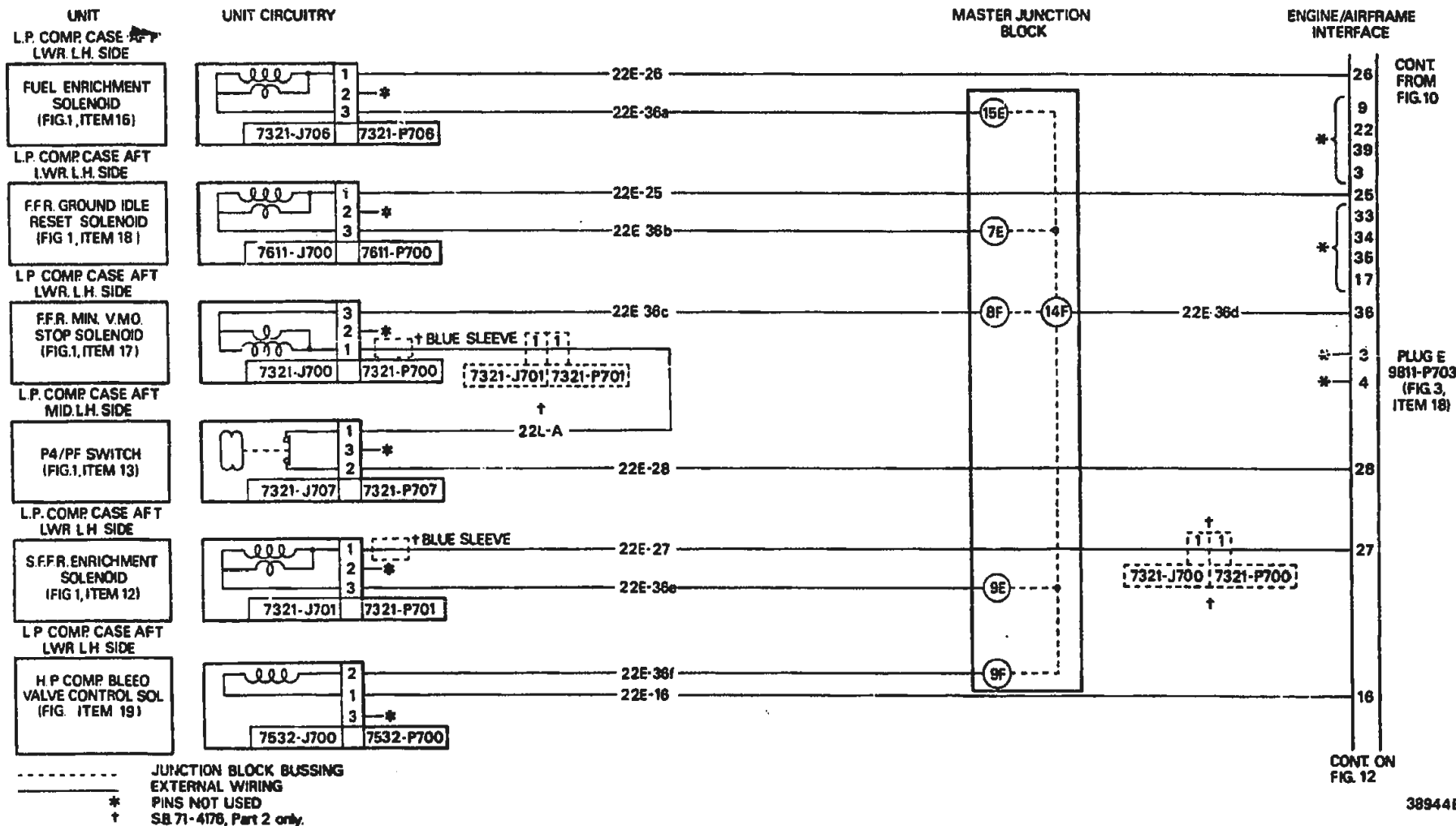
71-50-00

Page 76
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



Propulsion system wiring diagram (S.B.71-4176 and
 Pre S.B.71-5474)
 Fig.11 (Sheet 3)

R
R
0508 EFFECTIVITY: ALL

2A

71-50-00
 Page 77/78
 Nov 15/81

38944B



RB.211 Propulsion System

MAINTENANCE

R

This page left blank intentionally

050B

EFFECTIVITY: ALL

2A

71-50-00
Page 79
Nov 15/81



RB.211 Propulsion System

MAINTENANCE

Code	Identification
R 22E-16	7321-7058 A18
R 22E-25	7611-7000 A18
R 22E-26	7321-7027 A18
R 22E-27	7321-7000 A18 (S.B.71-4176 Part 1)
R 22E-28	7532-7003 A18
R 22E-36a	7321-7026 A18
R 22E-36b	7321-7057 A18
R 22E-36c	7321-7001 A18
R 22E-36d	7321-7001 B18
R 22E-36e	7321-7002 A18
R 22E-36f	8011-7011 A18
R 22L-A	7532-7002 A18

R

Key to Fig.11 (Sheet 4)

EFFECTIVITY: ALL

0508

2A

71-50-00
Page 80
Nov 15/81



PLUG E
9811-P703
(FIG 3.
ITEM 18)

CONT. ON
FIG 12

45402

RR

050B

2A

71-50-00

Page 81/82
Nov 15/81



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

R
R
050B

EFFECTIVITY: ALL

2A

71-50-00
Page 83
Feb 15/79



RB.211 Propulsion System

MAINTENANCE

Code	Identification
22E-5	8011-7006 A18
22E-5a	8011-7006 B18
22E-7	8011-7002 A18
22E-8	8011-7004 A18
22E-8a	8011-7004 B18
22E-11	3021-7002 A18
22E-11a	3021-7002 B18
22E-12	3021-7000 A18
22E-12a	3021-7000 B18
22E-13	3021-7003 A18
22E-13a	3021-7003 B18
22E-14	3021-7001 A18
22E-14a	3021-7001 B18
22E-36p	3021-7004 B18
22E-36q	3021-7005 A18
22E-36r	3021-7004 A18
22E-37	8011-7003 A18
22E-42	3021-7005 A18
22E-42a	3021-7005 B18

Key to Fig.12 (Sheet 1)

R
R
050B

EFFECTIVITY: ALL

2A

71-50-00
Page 84
Nov 15/81



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

R
R
0508

EFFECTIVITY: ALL

2A

71-50-00

Page 87
Feb 15/79



RB.211 Propulsion System

MAINTENANCE

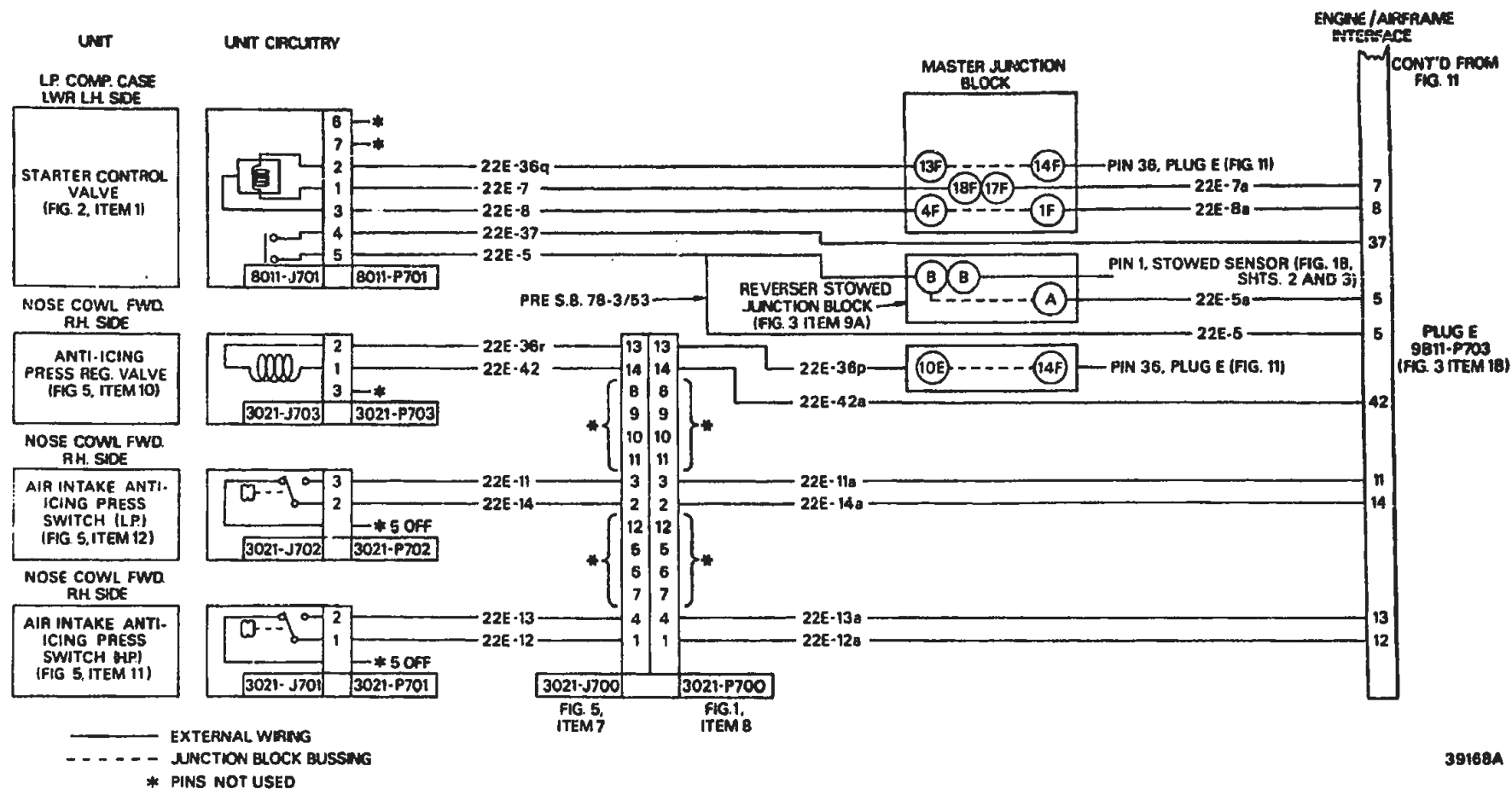
Code	Identification
22E-5	8011-7006 A18
22E-5a	8011-7006 B18
22E-7	8011-7002 A18
22E-7a	8011-7002 B18
22E-8	8011-7004 A18
22E-8a	8011-7004 B18
22E-11	3021-7002 A18
22E-11a	3021-7002 B18
22E-12	3021-7000 A18
22E-12a	3021-7000 B18
22E-13	3021-7003 A18
22E-13a	3021-7003 B18
22E-14	3021-7001 A18
22E-14a	3021-7001 B18
22E-36p	3021-7004 B18
22E-36q	3021-7005 A18
22E-36r	3021-7004 A18
22E-37	8011-7003 A18
22E-42	3021-7005 A18
22E-42a	3021-7005 B18

Key to Fig.12 (Sheet 2)

R
R
050B EFFECTIVITY: ALL 2A

71-50-00
Page 88
Nov 15/81

BB.211 Propulsion System
MAINTENANCE



39168A

Propulsion system wiring diagram (Pre and S.B.78-3753 and S.B.71-3641) Fig.12 (Sheet 2)

R EFFECTIVITY: ALL
R
0508

2A

71-50-00
Page 89/90
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

R
R
050B

EFFECTIVITY: ALL

2A

71-50-00
Page 91
Feb 15/79



RB.211 Propulsion System

MAINTENANCE

Code	Identification
22Q1-15	2911-7000 A18
22Q1-16	2911-7001 A18
22Q1-18	2911-7002 A18
22Q1-19	2911-7003 A18

Key to Fig.13 (Sheet 1)

R
R
0508

EFFECTIVITY: ALL

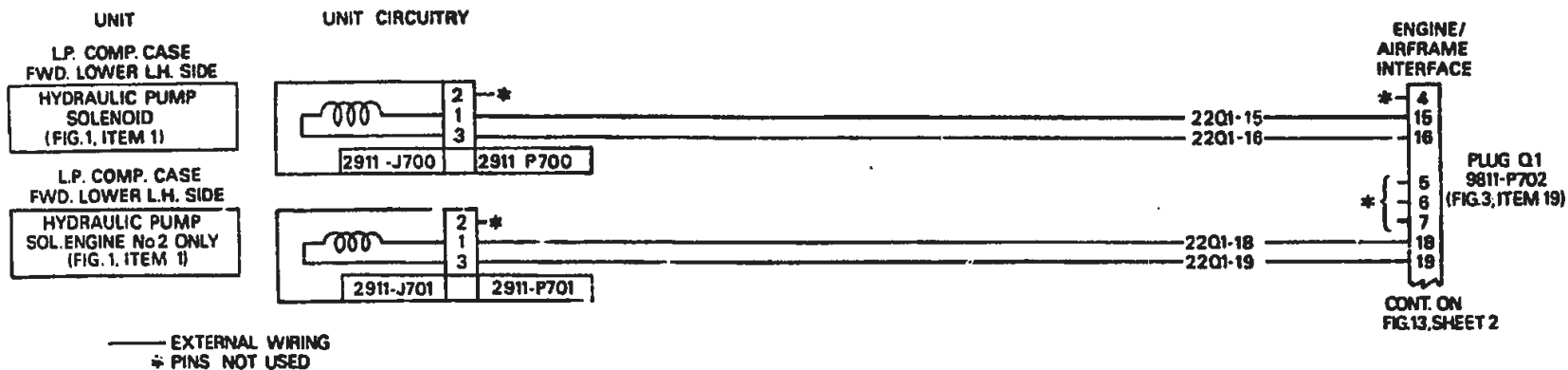
2A

71-50-00
Page 92
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



39421A

Propulsion system wiring diagram
Fig.13 (Sheet 1)

R
R
050B EFFECTIVITY: ALL

2A

71-50-00
Page 93/94
Nov 15/81



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

R
R
050B

EFFECTIVITY: ALL

2A

71-50-00
Page 95
Feb 15/79



RB.211 Propulsion System

MAINTENANCE

Code	Identification
22FR-24	2621-P700 FR1
22FR-25	2621-P700 FR2
22FR-26	2621-P700 FR3
22FR-27	2621-P700 FR4
22FR-28	2621-P700 FR5
22FR-29	2621-P700 FR6
22Q1-1	7521-7002 A18
22Q1-1a	7521-7002 B18
22Q1-2	7521-7001 A18
22Q1-2a	7521-7001 B18
22Q1-3	7521-7000 A18
22Q1-3a	7521-7000 B18
22Q1-11	2621-7008 A18
22Q1-11a	2621-7008 B18
22Q1-12	2621-7007 A18
22Q1-12a	2621-7007 B18
22Q1-13	2621-7001 A18
22Q1-13a	2621-7001 B18
22Q1-14	2621-7000 A18
22Q1-14a	2621-7000 B18
22Q2-1	2621-7009 A18
22Q2-1a	2621-7009 B18
22Q2-2	2621-7012 A18 BLU
22Q2-3	2621-7013 A18 RED
22Q2-4	2621-7010 A18 BLU
22Q2-5	2621-7011 A18 RED
22Q2-6	2621-7002 A18
22Q2-6a	2621-7002 B18
22Q2-7	2621-7005 A18 BLU
22Q2-8	2621-7006 A18 RED
22Q2-9	2621-7003 A18 BLU
22Q2-10	2621-7004 A18 RED
22SL-A	2621-7002 C18
22SL-3	2621-7009 C18

Key to Fig.13 (Sheet 2)

R
R
050B

EFFECTIVITY: ALL

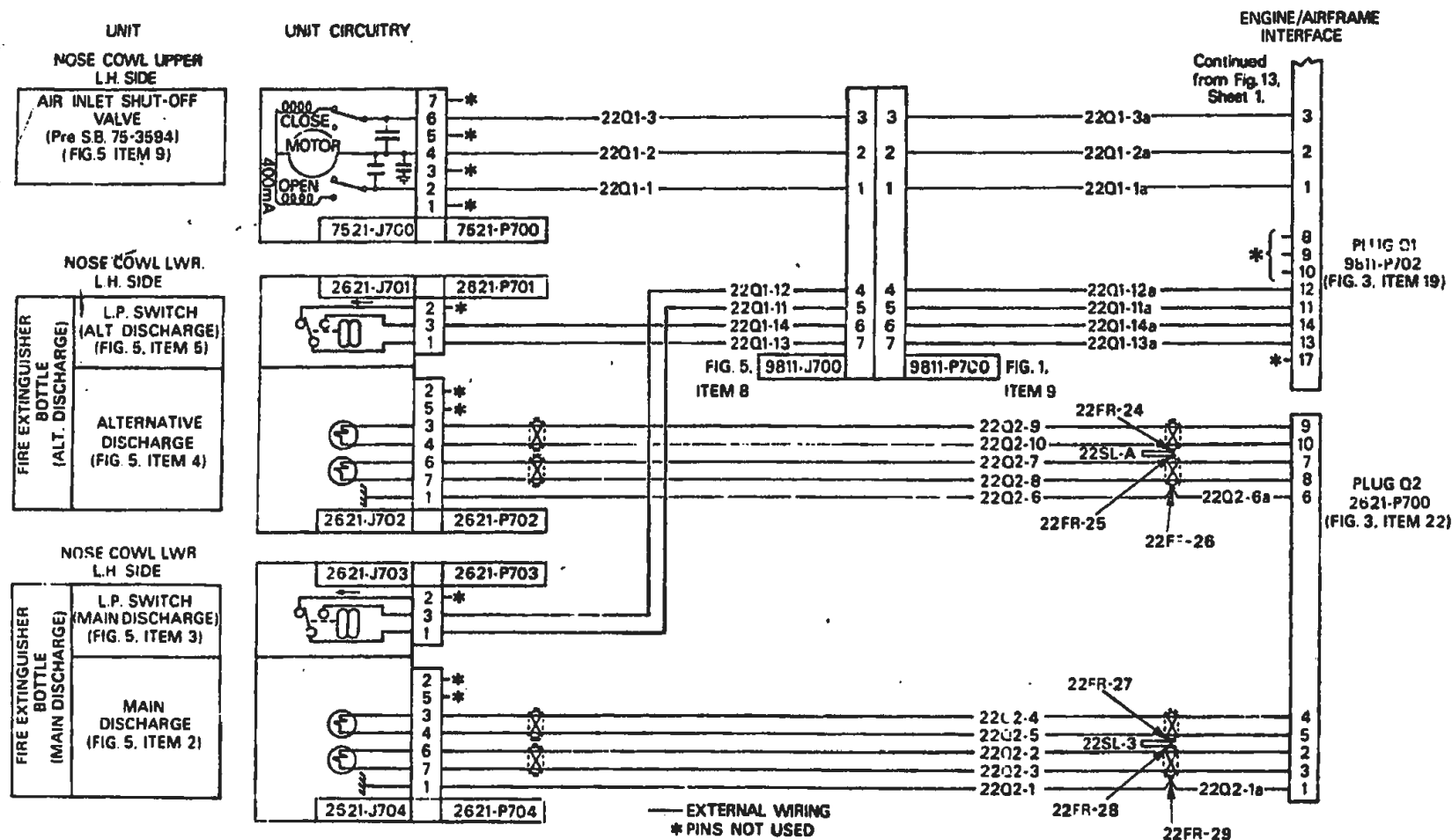
2A

71-50-00
Page 96
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



Propulsion system wiring diagram (Pre S.B.75-3594)
Fig.13 (Sheet 2)

R R
050B EFFECTIVITY: ALL

71-50-00
Page 97/98
Nov 15/81

2A

39169



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 99
Nov 15/89



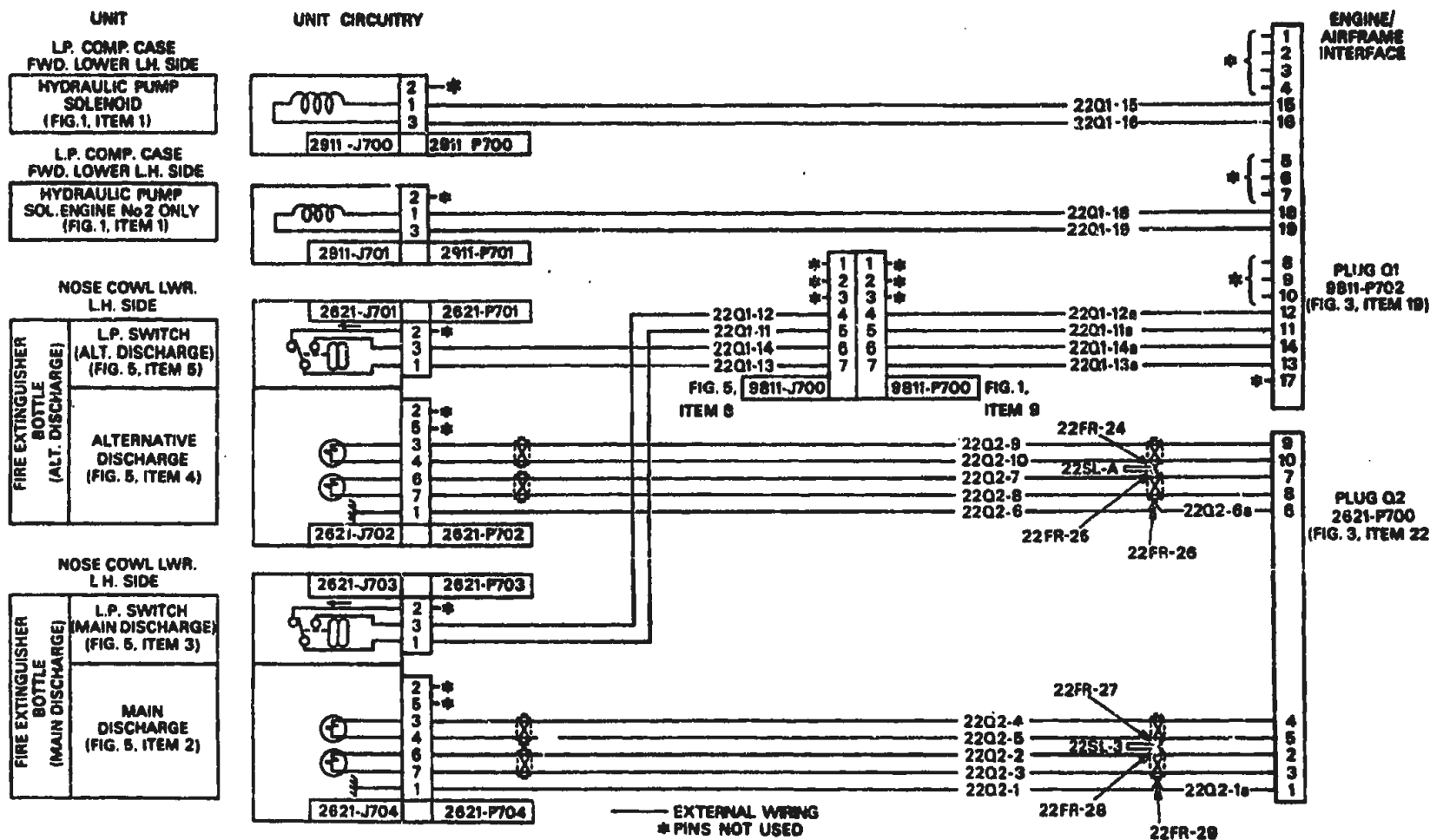
MAINTENANCE

9

Identification

R-24	2621-P700	FR1	
R-25	2621-P700	FR2	
R-26	2621-P700	FR3	
R-27	2621-P700	FR4	
R-28	2621-P700	FR5	
R-29	2621-P700	FR6	
I-11	2621-7008	A18	
I-11a	2621-7008	B18	
I-12	2621-7007	A18	
I-12a	2621-7007	B18	
I-13	2621-7001	A18	
I-13a	2621-7001	B18	
I-14	2621-7000	A18	
I-14a	2621-7000	B18	
I-15	2911-7000	A18	
I-16	2911-7001	A18	
I-18	2911-7002	A18	
I-19	2911-7003	A18	
I-1	2621-7009	A18	
I-1a	2621-7012	A18	BLU
I-2	2621-7012	A18	BLU
I-3	2621-7013	A18	RED
I-4	2621-7010	A18	BLU
I-5	2621-7011	A18	RED
I-6	2621-7002	A18	
I-6a	2621-7002	B18	
I-7	2621-7005	A18	BLU
I-8	2621-7006	A18	RED
I-9	2621-7003	A18	BLU
I-10	2621-7004	A18	RED
I-A	2621-7002	C18	
I-3	2621-7009	C18	

Key to Fig.13 (Sheet 3)



39172A

Propulsion system wiring diagram (S.B.75-3594)
Fig.13 (Sheet 3)

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 101/102
Nov 15/89



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

EFFECTIVITY: ALL

050B

2A



MAINTENANCE

Code	Identification
22E-8b	3611-7004 A18
22FR-46	9811-TB700 FR2
22FR-47	9811-TB700 FR1
22FR-48	7421-G701 FR1
22FR-49	7421-G701 FR2
22FR-50	7421-G700 FR2
22FR-51	7421-G700 FR1
22G-3	3611-7000 A18
22G-9	3611-7001 A18
22G-9a	3611-7002 A18
22G-9b	3611-7001 B18
22G-23	3611-7003 A18
22G-26	7431-7001 A18 BLU
22G-27	7431-7000 A18 RED
22G-28	7431-7002 A18 YEL
22G-40	7431-7004 A18 BLU
22G-41	7431-7005 A18 RED
22G-42	7431-7003 A18 YEL
22H-37	7712-7001 A18 BLU
22H-38	7712-7000 A18 RED
22H-39	7712-7014 A18
22H-39a	7712-7014 B18
22IG-A	7421-7001 A12
22IG-B	7421-7000 A12

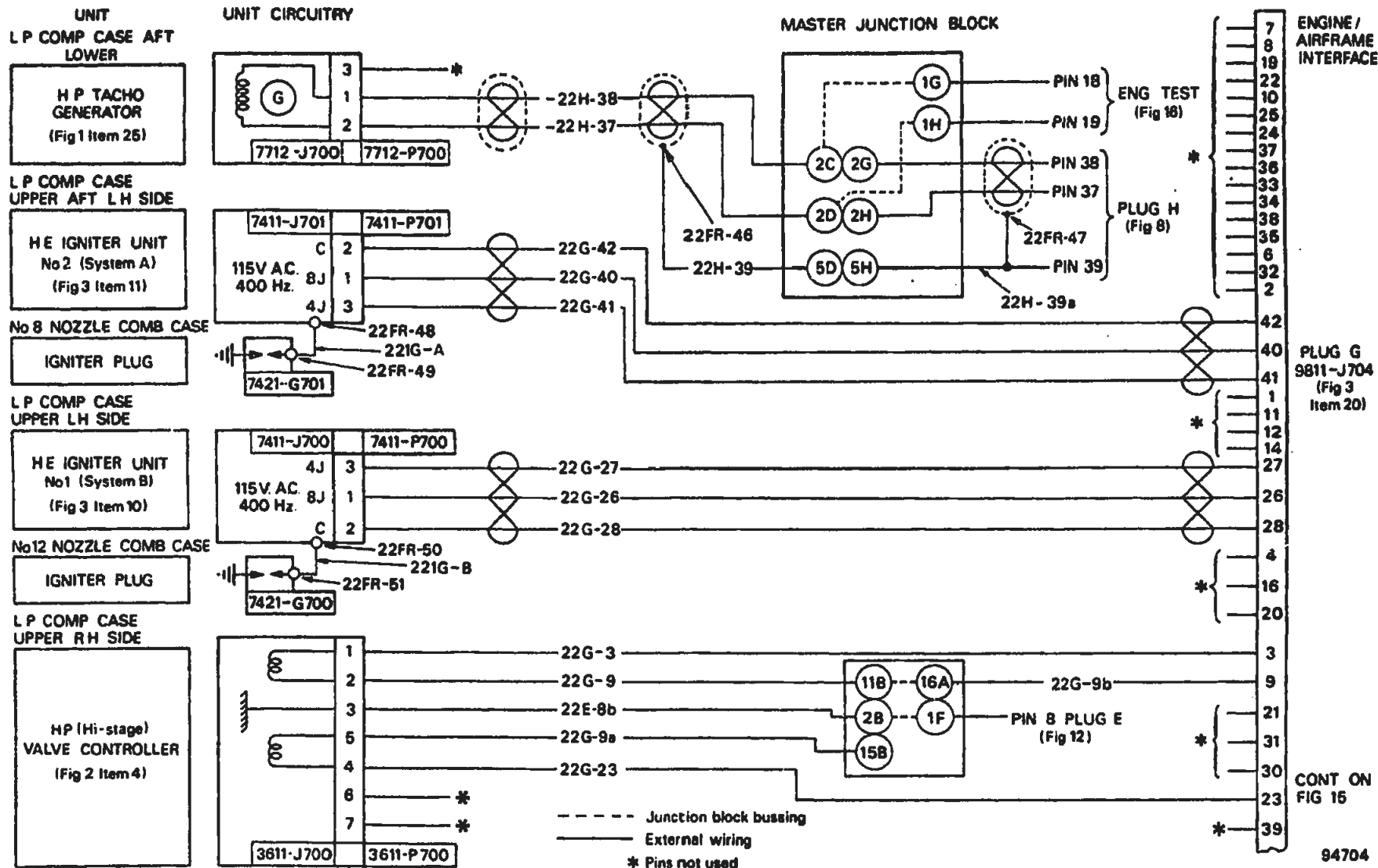
Key to Fig.14

EFFECTIVITY: ALL

71-50-00

Page 104
Nov 15/89

2A



Propulsion system wiring diagram
Fig.14

EFFECTIVITY: ALL

R-R Data
Page 98.9
Nov. 15/89



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 107
Nov 15/89

98.10
15/89



RB.211 Propulsion System

MAINTENANCE

de

Identification

AL-A	7321-7038	A18	
A3-9	7321-7023	D18	
ET-14a	7321-7005	G18	RED
ET-15a	7321-7006	G18	BLU
FP-A	7321-7036	A18	
FP-B	7321-7037	A18	
FP-C	7321-7010	A18	
FP-D	7321-7009	A18	
FP-E	7321-7008	A18	
FP-F	7321-7007	A18	
FP-G	7321-7006	A18	
FP-H	7321-7005	A18	RED
FP-J	7321-7004	A18	BLU
FR-1	7321-P702	FR1	
FR-2	7321-P702	FR2	
FR-3	7321-P703	FR2	
FR-4	7321-P703	FR1	
FR-5			
FS-B	7321-7023	B18	
FS-C	7321-7023	C18	
G-A	7321-7029	A18	
G-B	7321-GS700		
G-5	7321-7013	B18	
G-5a	7321-7013	A18	
G-13	7321-7015	B18	RED
G-13a	7321-7015	A18	RED
G-15	7321-7014	B18	
G-15a	7321-7014	A18	
G-17	7321-7012	A18	
G-18	7321-7011	A18	
G-29	7321-7016	B18	BLU
G-29a	7321-7016	A18	BLU
MS-A			
P-1	7321-7015	C18	RED
P-2	7321-7016	C18	BLU
SV-1	8011-7002	D18	
VR-14	7321-7023	A18	

Key to Fig.15 (Sheet 1)

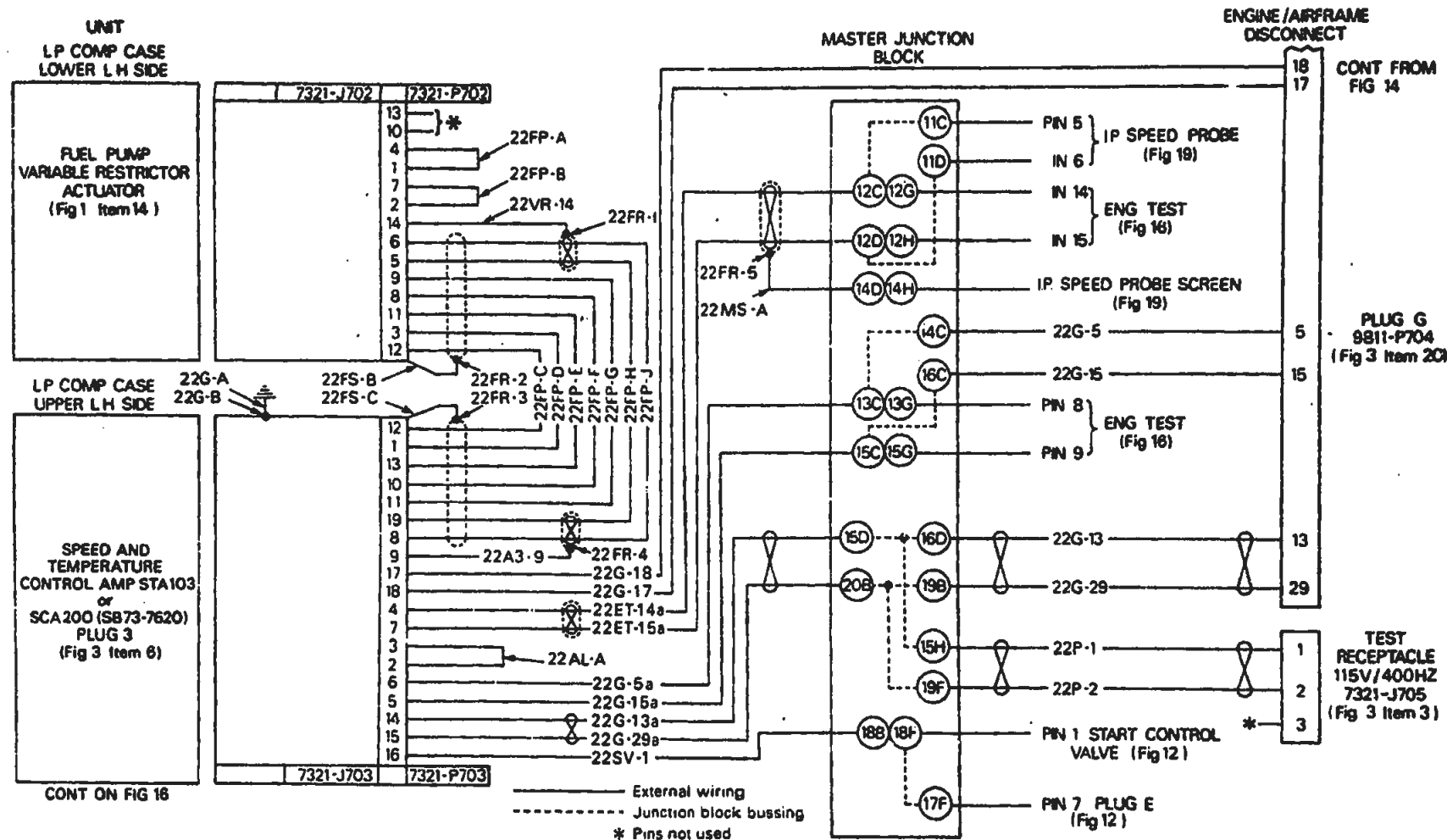
EFFECTIVITY: ALL

2A

71-50-00
Page 108
Nov 15/89



MAINTENANCE



94714

Propulsion system wiring diagram (S.B.71-3641 and Pre S.B.73-4024)
Fig.15 (Sheet 1)

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 109/110
Nov 15/89



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

EFFECTIVITY: ALL

0508

2A

Sta
98.14
5/89



RB.211 Propulsion System

MAINTENANCE

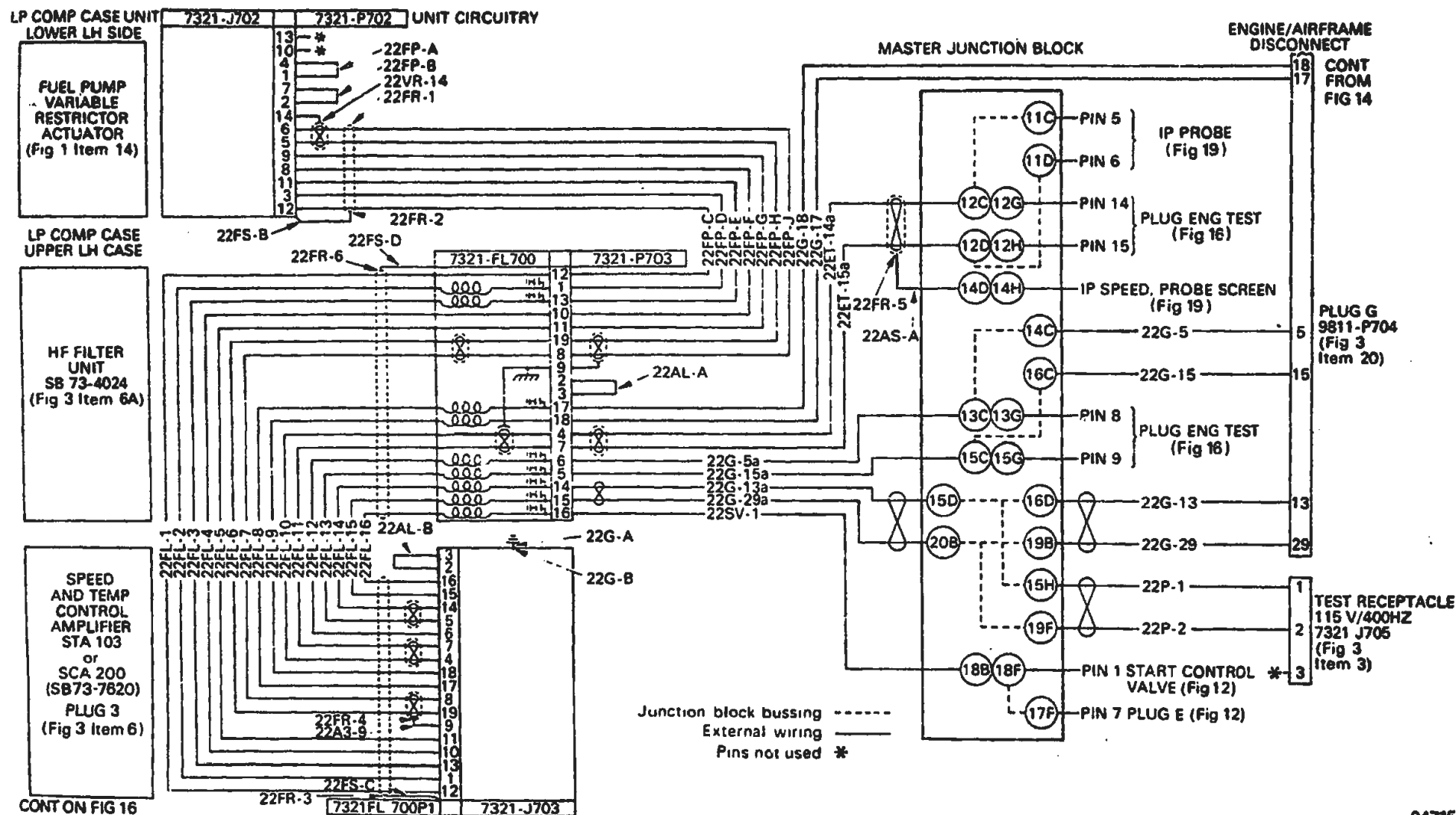
le	Identification	Code	Identification
L-A	7321-7038 A18	22G-5a	7321-7013 A18
L-B		22G-13	7321-7015 B18 RED
S-A		22G-13a	7321-7015 A18 RED
3-9		22G-15	7321-7014 B18
T-14a	7321-7005 G18 RED	22G-15a	7321-7014 A18
T-15a	7321-7006 G18 RED	22G-17	7321-7012 A18
L-1		22G-18	7321-7011 A18
L-2		22G-29	7321-7016 B18 BLU
L-3		22G-29a	7321-7016 A18 BLU
L-4		22P-1	7321-7015 C18 RED
L-5		22P-2	7321-7016 C18 BLU
FL-6		22SV-1	8011-7002 D18
FL-7		22VR-14	7321-7023 A18
FL-8			
FL-9			
FL-10			
FL-11			
FL-12			
FL-13			
FL-14			
FL-15			
FL-16			
FP-A	7321-7036 A18		
FP-B	7321-7037 A18		
FP-C	7321-7010 A18		
FP-D	7321-7009 A18		
FP-E	7321-7008 A18		
FP-F	7321-7007 A18		
FP-G	7321-7006 A18		
FP-H	7321-7005 A18 RED		
FP-J	7321-7004 A18 BLU		
FS-B	7321-7023 B18		
FS-C			
FS-D			
FR-1	7321-P702 FR1		
FR-2	7321-P702 FR2		
FR-4			
FR-5			
FR-6			
2G-A	7321-7023 B18		
2G-B	7321-GS700		
2G-5	7321-7013 B18		

Key to Fig.15 (Sheet 2)

EFFECTIVITY: ALL

2A

71-50-00
Page 112
Nov 15/89



Propulsion system wiring diagram (S.B.71-3641 and S.B.73-4024)
Fig.15 (Sheet 2)

EFFECTIVITY: ALL

R-R Data
Page 98.17
Nov.15/89



RB.211 Propulsion System MAINTENANCE

This page left blank intentionally

EFFECTIVITY: ALL

0508

2A

71-50-00
Page 115
Nov 15/89



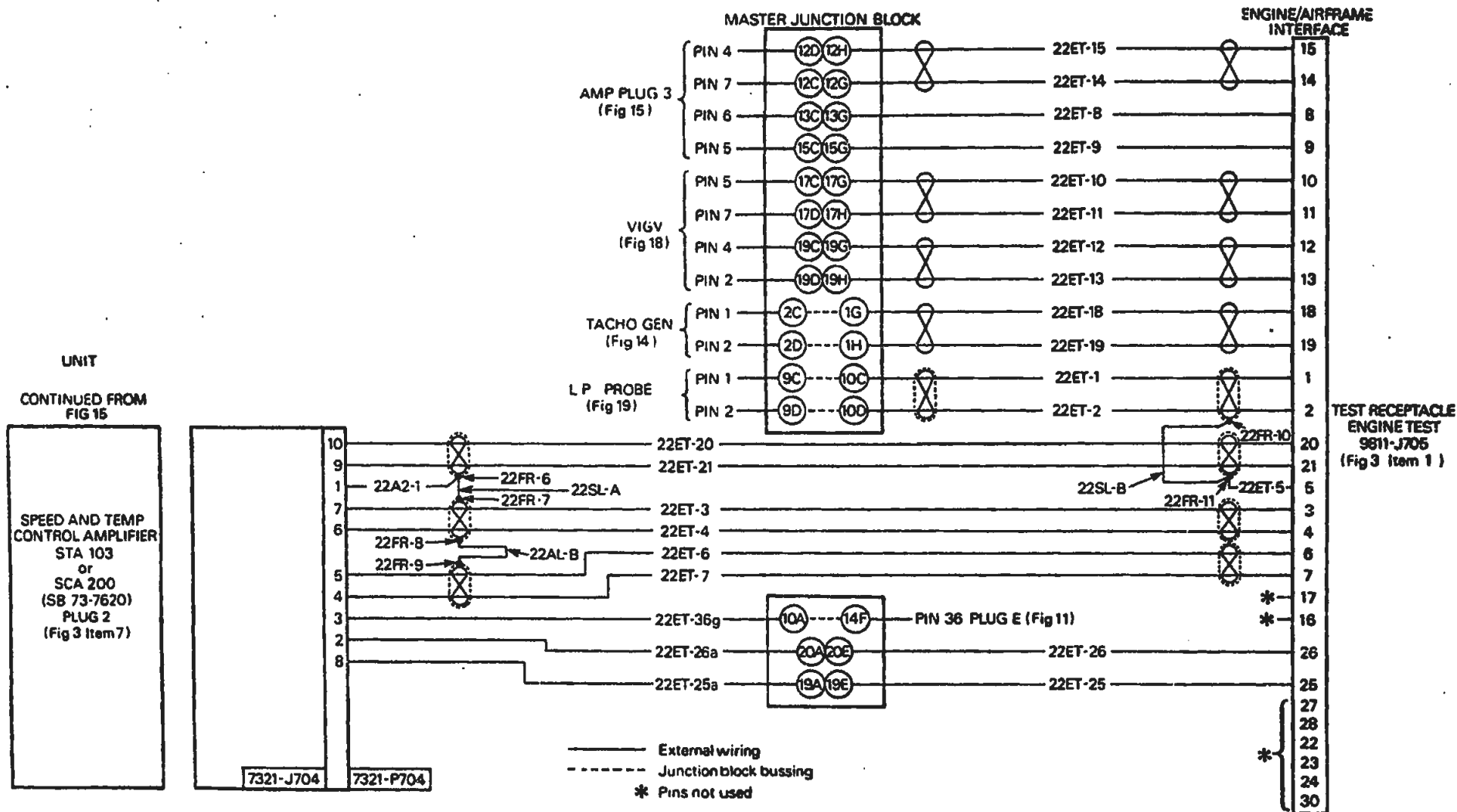
Code	Identification
22AL-B	7321-7025 D18
22A2-1	7321-7025 A18
22ET-1	7712-7008 E18 BLU
22ET-2	7712-7009 E18 RED
22ET-3	7321-7019 A18 RED
22ET-4	7321-7020 A18 BLU
22ET-5	7321-7025 C18
22ET-6	7321-7021 A18 RED
22ET-7	7321-7022 A18 BLU
22ET-8	7321-7013 C18
22ET-9	7321-7014 C18
22ET-10	7541-7000 C18 BLU
22ET-11	7541-7001 C18 RED
22ET-12	7541-7002 C18 BLU
22ET-13	7541-7003 C18 RED
22ET-14	7712-7005 E18 RED
22ET-15	7712-7006 E18 BLU
22ET-18	7712-7000 C18 RED
22ET-19	7712-7001 C18 BLU
22ET-20	7321-7017 A18 RED
22ET-21	7321-7018 A18 BLU
22ET-25	7321-7032 B18
22ET-25a	7321-7032 A18 RED
22ET-26	7321-7033 B18
22ET-26a	7321-7033 A18 BLU
22ET-36g	8011-7002 C18
22FR-6	7321-P704 FR1
22FR-7	7321-P704 FR2
22FR-8	7321-P704 FR3
22FR-9	7321-P704 FR4
22FR-10	9811-J705 FR3
22FR-11	9811-J705 FR1
22SL-A	7321-7025 B18
22SL-B	7712-7010 E18

Key to Fig.16 (Sheet 1)

EFFECTIVITY: ALL

050B

2A



Propulsion system wiring diagram (S.B.71-3641 and Pre S.B.71-4023)
Fig.16 (Sheet 1)

EFFECTIVITY: ALL

2A

71-50-00
Page 117/118
Nov 15/89

050B

94716



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

050B

EFFECTIVITY: ALL

2A



RB.211 Propulsion System

MAINTENANCE

Code	Identification
22A-GRD	8011-7002 C18
22AL-B	7321-7025 D18
22AL-C	7321-7025 E18
22A2-1	7321-7025 A18
22ET-1	7712-7008 E18 BLU
22ET-2	7712-7009 E18 RED
22ET-3	7321-7019 A18 RED
22ET-4	7321-7020 A18 BLU
22ET-5	7321-7025 C18
22ET-6	7321-7021 A18 RED
22ET-7	7321-7022 A18 BLU
22ET-8	7321-7013 C18
22ET-9	7321-7014 C18
22ET-10	7541-7000 C18 BLU
22ET-11	7541-7001 C18 RED
22ET-12	7541-7002 C18 BLU
22ET-13	7541-7003 C18 RED
22ET-14	7712-7005 E18 RED
22ET-15	7712-7006 E18 BLU
22ET-18	7712-7000 C18 RED
22ET-19	7712-7001 C18 BLU
22ET-20	7321-7017 A18 RED
22ET-21	7321-7018 A18 BLU
22ET-25a	7321-7032 A18 RED
22ET-26a	7321-7033 A18 BLU
22FR-6	7321-P704 FR1
22FR-7	7321-P704 FR2
22FR-8	7321-P704 FR3
22FR-9	7321-P704 FR4
22FR-10	9811-J705 FR3
22FR-11	9811-J705 FR1
22FR-12	7321-P704 FR5
22FR-13	7321-P704 FR6
22SL-A	7321-7025 B18
22SL-B	7712-7010 E18

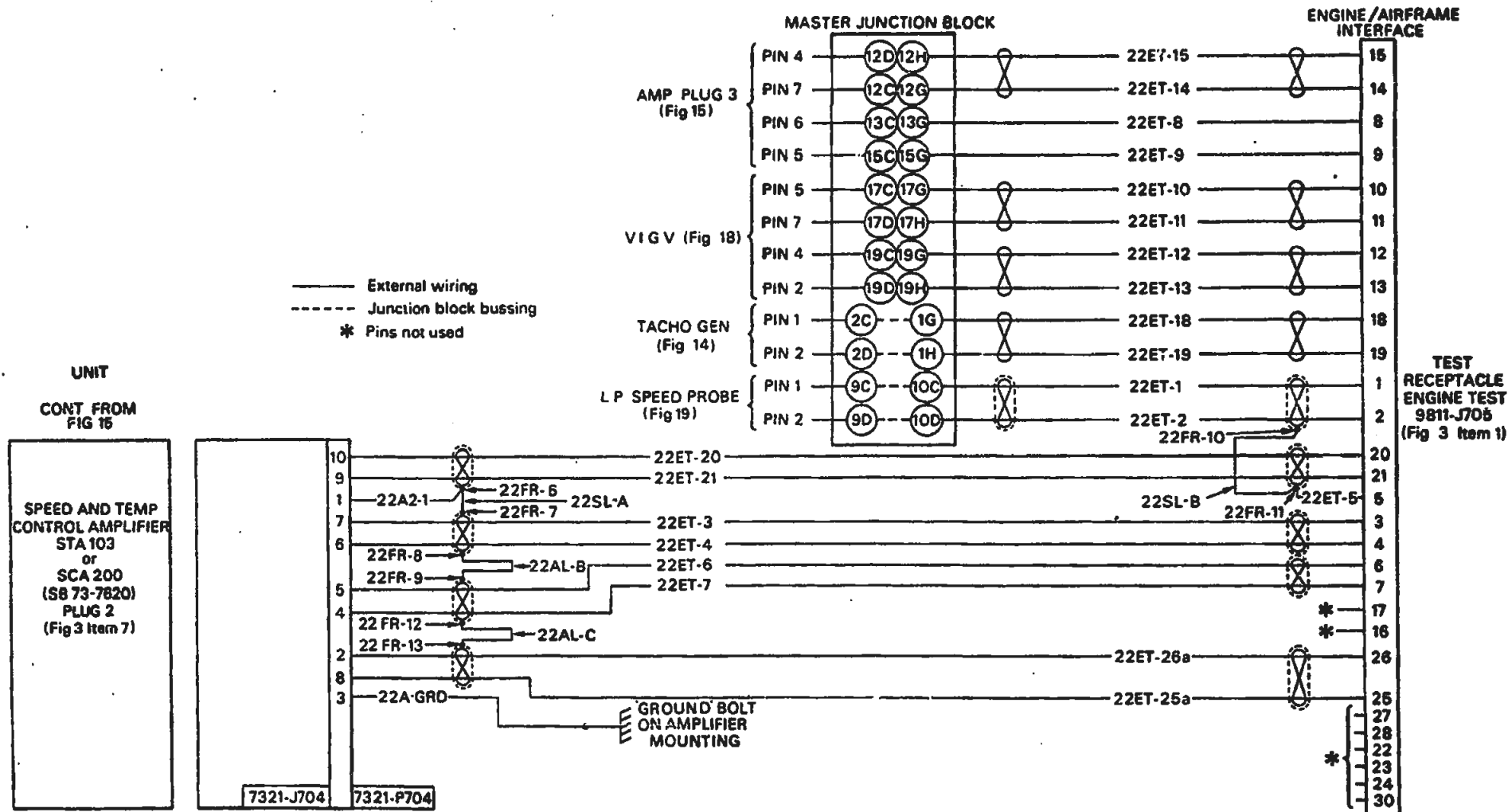
Key to Fig.16 (Sheet 2)

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 120
Nov 15/89



94717

Propulsion system wiring diagram (S.B.71-3641 and S.B.71-4023)
Fig.16 (Sheet 2)

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 121/122
Nov 15/89

R-R Data
Page 98.25
Nov.15/89



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

EFFECTIVITY: ALL

0508

2A

71-50-00
Page 123
Nov 15/89



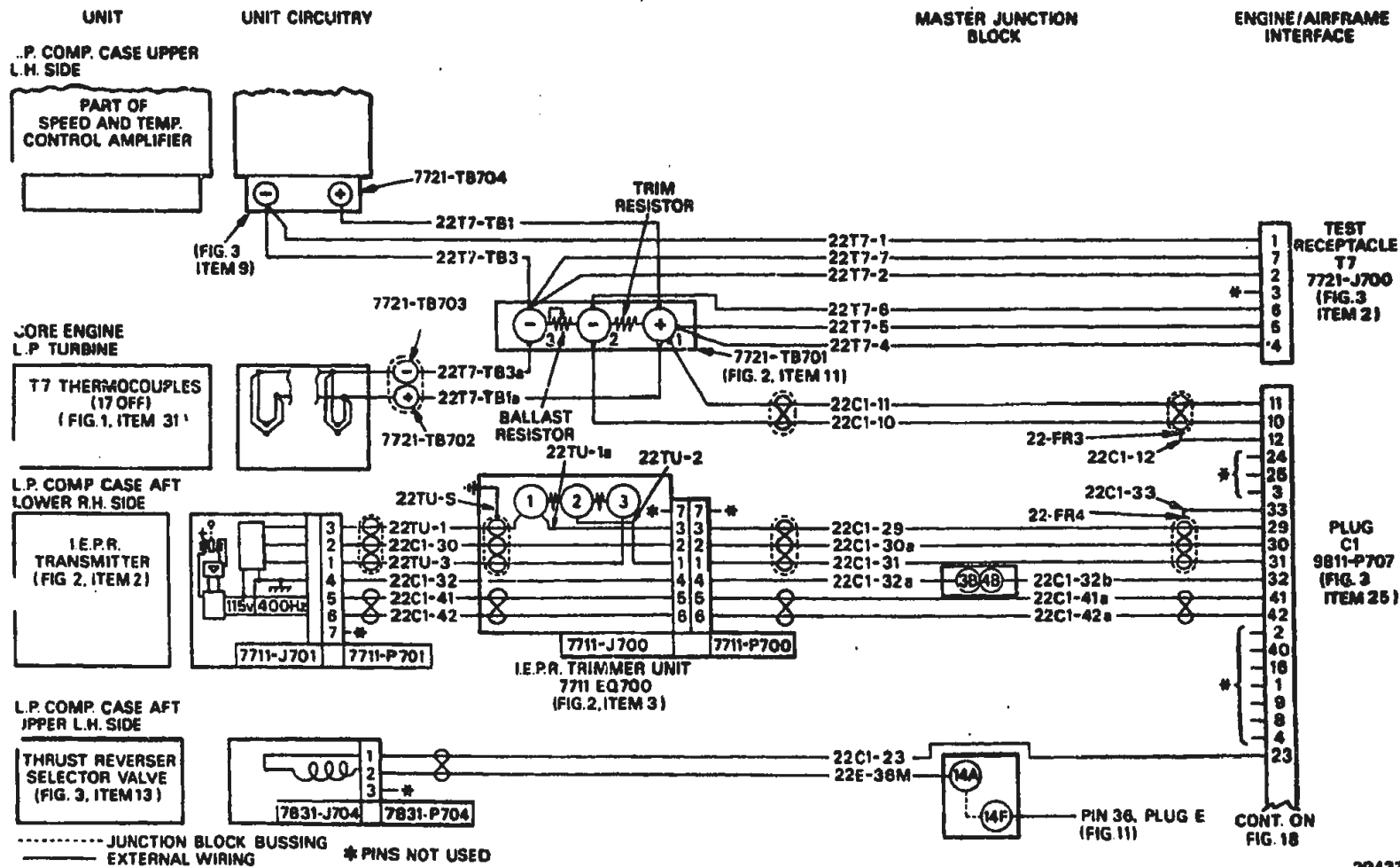
MAINTENANCE

Code	Identification
22C1-10	7721-7002B-ALML
22C1-11	7721-7000E-CHROM
22C1-12	7721-7003 A18
22C1-23	7831-7000 A18 RED
22C1-29	7711-7000 A18 RED (Pre S.B.72-3732)
22C1-29	7712-7000 B18 RED (S.B.72-3732)
22C1-30	7711-7001 B18 (Pre and S.B.72-3732)
22C1-30a	7711-7001 A18 BLU (Pre S.B.72-3732)
22C1-30a	7711-7001 B18 BLU (S.B.72-3732)
22C1-31	7711-7002 A18 YEL (Pre S.B.72-3732)
22C1-31	7711-7002 B18 YEL (S.B.72-3732)
22C1-32	7711-7003 C18 (Pre and S.B.72-3732)
22C1-32a	7711-7003 A18 (Pre S.B.72-3732)
22C1-32a	7711-7003 B18 (S.B.72-3732)
22C1-32b	7711-7003 B18 (Pre S.B.72-3732)
22C1-32b	7711-7003 C18 (S.B.72-3732)
22C1-33	7711-7006 A18 (Pre S.B.72-3732)
22C1-33	7711-7006 A18 (S.B.72-3732)
22C1-41	7711-7004 B18 RED (Pre and S.B.72-3732)
22C1-41a	7711-7004 A18 RED (Pre S.B.72-3732)
22C1-41a	7711-7004 B18 RED (S.B.72-3732)
22C1-42	7711-7005 B18 BLU (Pre and S.B.72-3732)
22C1-42a	7711-7005 A18 BLU (Pre S.B.72-3732)
22C1-42a	7711-7005 B18 BLU (S.B.72-3732)
22E-36m	7831-7001 A18 BLU
22-FR3	9811-P707 FR1
22-FR4	9811-P707 FR2
22T7-1	7721-7001 E18
22T7-2	7721-7001D-ALML
22T7-4	7721-7000D-CHROM
22T7-5	7721-7000 C18
22T7-6	7721-7002A-ALML
22T7-7	7721-7001 C18
22T7-TB1	7721-7000B-CHROM
22T7-TB1a	7721-7000A-CHROM
22T7-TB3	7721-7001B-ALML
22T7-TB3a	7721-7001A-ALML
22TU-1	7711-7000 B18 RED (Pre and S.B.72-3732)
22TU-1a	
22TU-2	
22TU-3	7711-7002 B18 YEL (Pre and S.B.72-3732)
22TU-S	7711-G700

Key to Fig.17

EFFECTIVITY: ALL

RB.211 Propulsion System **MAINTENANCE**



39437A

Propulsion system wiring diagram
Fig.17

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 125/126
Nov 15/89

R-R Data
Page 98.29
Nov.15/89



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 127
Nov 15/89



RB.211 Propulsion System

MAINTENANCE

Code	Identification
22C1-17	7831-7008 B18 RED
22C1-17a	7831-7008 C18 RED
22C1-19	7831-7009 B18 BLU
22C1-19a	7831-7009 C18 BLU
22C1-20	7831-7005 B18 RED
22C1-22	7831-7006 B18 BLU
22C1-34	7831-7004 B18 YEL
22C1-34a	7831-7004 C18
22C1-35	7831-7003 B18 BLU
22C1-36	7831-7002 B18 RED
22C1-39	7831-7007 B18 YEL
22C1-39a	7831-7007 C18
22C1-39c	7831-7010 B18 YEL
22C1-39d	7831-7010 C18 YEL
22ES-1	7831-7008 A18 RED
22ES-2	7831-7009 A18 BLU
22ES-3	7831-7010 A18 YEL
22ET-10a	7541-7000 B18 BLU
22ET-10b	7541-7000 A18 BLU
22ET-11a	7541-7001 B18 RED
22ET-11b	7541-7001 A18 RED
22ET-12a	7541-7002 B18 BLU
22ET-12b	7541-7002 A18 BLU
22ET-13a	7541-7003 B18 RED
22ET-13b	7541-7003 A18 RED
22LR-1	7831-7005 A18 RED
22LR-2	7831-7006 A18 BLU
22LR-3	7831-7007 A18 YEL
22PS-1	7831-7002 A18 RED
22PS-2	7831-7003 A18 BLU
22PS-3	7831-7004 A18 YEL

Key to Fig.18 (Sheet 1)

EFFECTIVITY: ALL

050B

2A

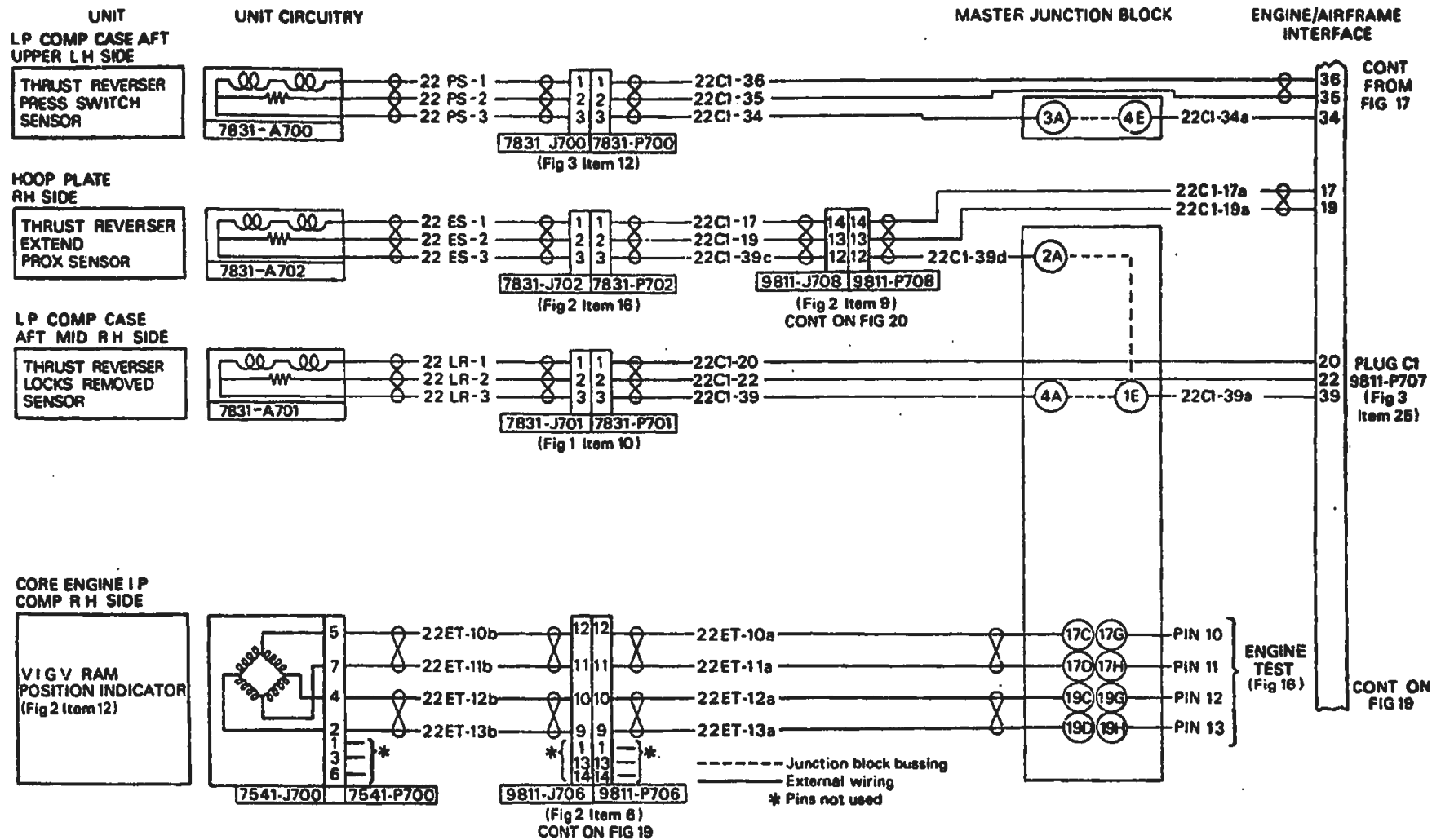
71-50-00
Page 128
Nov 15/89



RB.211

Propulsion System

MAINTENANCE



94709

Propulsion system wiring diagram (Pre S.B.73-3753 and
Pre S.B.72-3732) Fig.18 (Sheet 1)

EFFECTIVITY: ALL

2A

71-50-00
Page 129/130
Nov 15/89

R-R Data
Page 98.33
Nov. 15/89



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 131
Nov 15/89

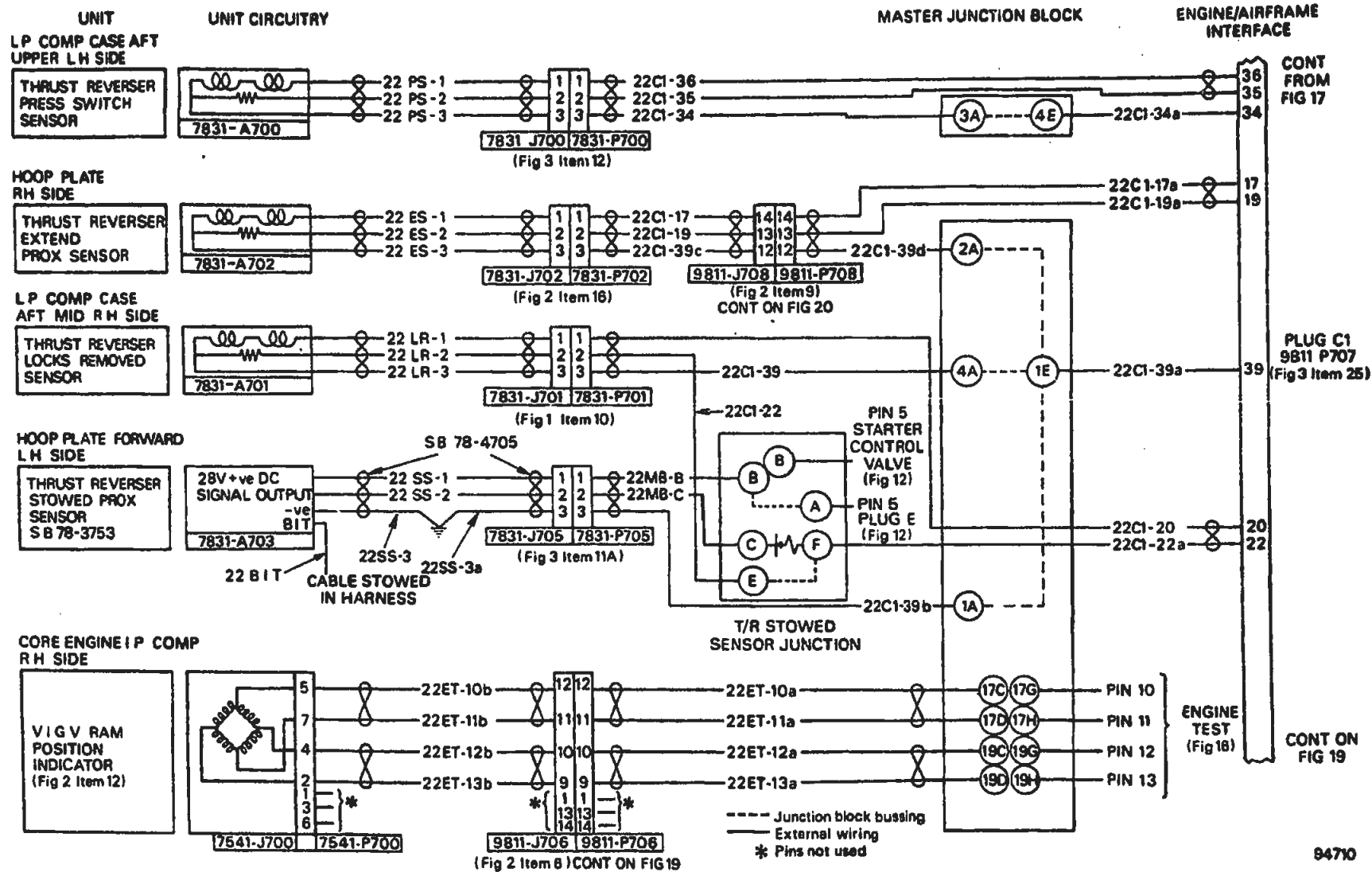


MAINTENANCE

Code	Identification
22B.I.T.	Orange
22C1-17	7831-7008 B18 RED
22C1-17a	7831-7008 C18 RED
22C1-19	7831-7009 B18 BLU
22C1-19a	7831-7009 C18 BLU
22C1-20	7831-7005 B18 RED
22C1-22	7831-7006 B18 BLU
22C1-22a	7831-7006 C18 BLU
22C1-34	7831-7004 B18 YEL
22C1-34a	7831-7004 C18
22C1-35	7831-7003 B18 BLU
22C1-36	7831-7002 B18 RED
22C1-39	7831-7007 S18 YEL
22C1-39a	7831-7007 C18
22C1-39b	7831-7015 C18 YEL
22C1-39c	7831-7010 B18 YEL
22C1-39d	7831-7010 C18 YEL
22ES-1	7831-7008 B18 RED
22ES-2	7831-7009 B18 BLU
22ES-3	7831-7010 B18 YEL
22ET-10a	7541-7000 B18 BLU
22ET-10b	7541-7000 A18 BLU
22ET-11a	7541-7001 B18 RED
22ET-11b	7541-7001 A18 RED
22ET-12a	7541-7002 B18 BLU
22ET-12b	7541-7002 A18 BLU
22ET-13a	7541-7003 B18 RED
22ET-13b	7541-7003 A18 RED
22LR-1	7831-7005 A18 RED
22LR-2	7831-7006 A18 BLU
22LR-3	7831-7007 A18 YEL
22MB-B	7831-7013 B18 RED
22MB-C	7831-7014 B18 BLU
22PS-1	7831-7002 A18 RED
22PS-2	7831-7003 A18 BLU
22PS-3	7831-7004 A18 YEL
22SS-1	7831-7013 A20 RED
22SS-2	7831-7014 A20 GRN
22SS-3	7831-7015 B20 BLK
22SS-3a	7831-7015 A20 BLK

Key to Fig.18 (Sheet 2)

EFFECTIVITY: ALL



Propulsion system wiring diagram (S.B.78-3753 and Pre S.B.72-3732)
Fig.18 (Sheet 2)

EFFECTIVITY: ALL

0508

2A

71-50-00
Page 133/134
Nov 15/89

94710

R-R Data
Page 98.37
Nov.15/89



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 135
Nov 15/89



RB.211 Propulsion System

MAINTENANCE

Code	Identification
22B.I.T.	Orange
22C1-17	7831-7008 B18 RED
22C1-19	7831-7009 B18 BLU
22C1-20	7831-7005 B18 RED
22C1-22	7831-7006 B18 BLU
22C1-22a	7831-7006 C18 BLU
22C1-34	7831-7004 B18 YEL
22C1-34a	7831-7004 C18
22C1-35	7831-7003 B18 BLU
22C1-36	7831-7002 B18 RED
22C1-39	7831-7007 B18 YEL
22C1-39a	7831-7007 C18
22C1-39b	7831-7015 C18 YEL
22C1-39c	7831-7010 B18 YEL
22C1-39d	7831-7010 C18 YEL
22ES-1	7831-7008 B18 RED
22ES-2	7831-7009 B18 BLU
22ES-3	7831-7010 B18 YEL
22ET-10b	7541-7000 A18 BLU
22ET-11b	7541-7001 A18 RED
22ET-12b	7541-7002 A18 BLU
22ET-13b	7541-7003 A18 RED
22LR-1	7831-7005 A18 RED
22LR-2	7831-7006 A18 BLU
22LR-3	7831-7007 A18 YEL
22MB-B	7831-7013 B18 RED
22MB-C	7831-7014 B18 BLU
22PS-1	7831-7002 A18 RED
22PS-2	7831-7003 A18 BLU
22PS-3	7831-7004 A18 YEL
22SS-1	7831-7013 A20 RED
22SS-2	7831-7014 A20 GRN
22SS-3	7831-7015 B20 BLK
22SS-3a	7831-7015 A20 BLK

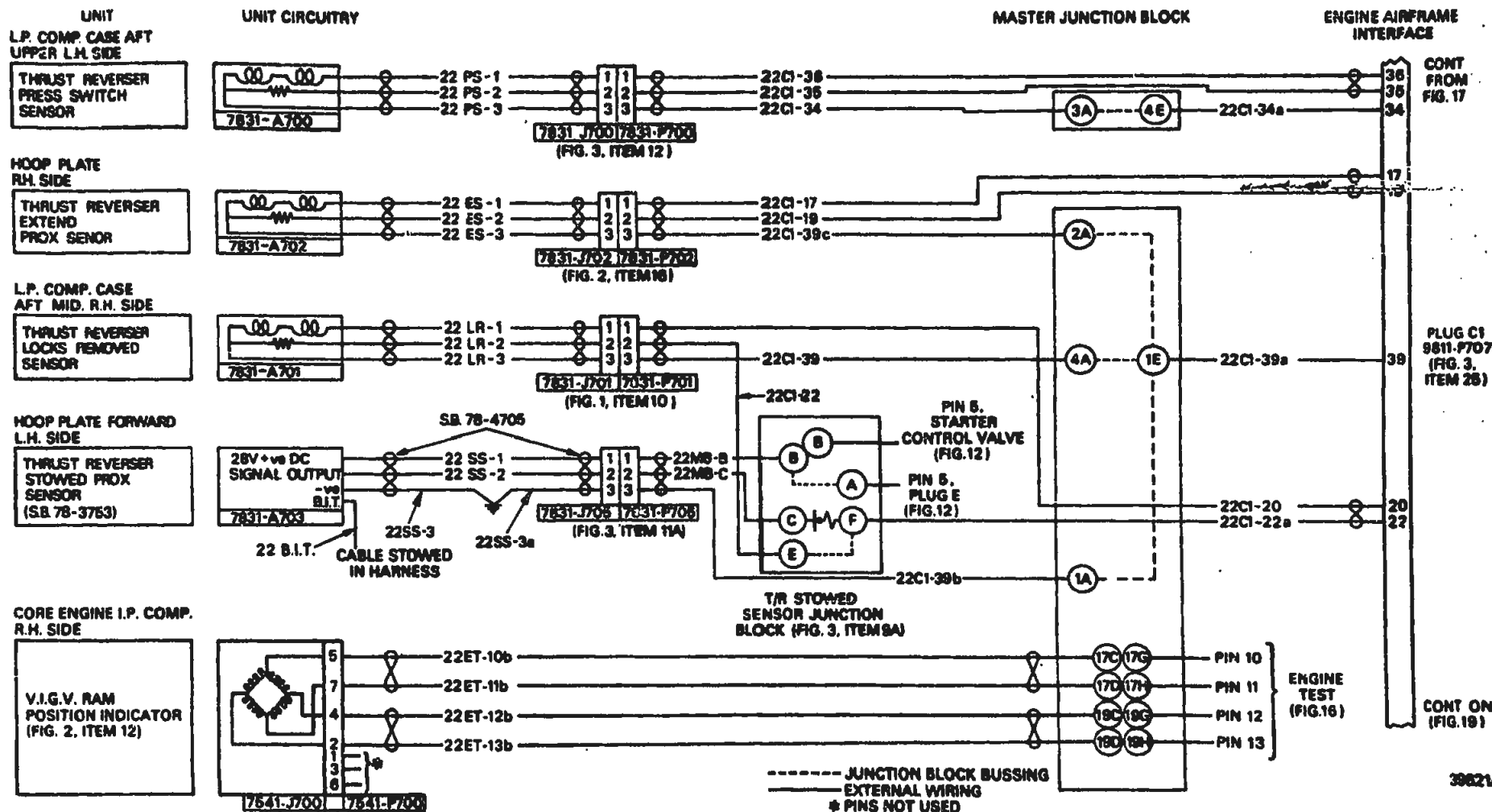
Key to Fig.18 (Sheet 3)

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 136
Nov 15/89



Propulsion system wiring diagram (S.B.78-3753 and S.B.72-3732)
Fig.18 (Sheet 3)

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 137/138
Nov 15/89



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally



RB.211 Propulsion System

MAINTENANCE

Code	Identification	Code	Identification
22C1-13	7712-7007 A18	22IP1-5	7712-7005 A18
22C1-13a	7712-7007 B18	22IP1-5a	7712-7005 B18 RED
22C1-13b	7712-7007 C18	22IP1-5b	7712-7005 C18 RED
22C1-13c	7712-7007 D18	22IP1-5c	7712-7005 D18 RED
22C1-13d	7712-7007 E18	22IP1-6	7712-7006 A18
22C1-13e	7712-7007 F18	22IP1-6a	7712-7006 B18 BLU
22C1-13f	7712-7007 G18	22IP1-6b	7712-7006 C18 BLU
22C1-14	7712-7006 F18 BLU	22IP1-6c	7712-7006 D18 BLU
22C1-15	7712-7005 F18 RED	22IP2-7	7712-7011 A18
22C1-26	7712-7010 A18	22IP2-7a	7712-7011 B18 BLU
22C1-26a	7712-7010 B18	22IP2-7b	7712-7011 C18 BLU
22C1-26b	7712-7010 C18	22IP2-7c	7712-7011 D18 BLU
22C1-26c	7712-7010 D18	22IP2-8	7712-7012 A18
22C1-26d	7712-7010 E18	22IP2-8a	7712-7012 B18 BLU
22C1-26e	7712-7010 F18	22IP2-8b	7712-7012 C18 BLU
22C1-27	7712-7009 F18 RED	22IP2-8c	7712-7012 D18 BLU
22C1-28	7712-7008 F18 BLU	22IPS	7712-7013 A18
22FR-30	7712-J701 FR2	22IPS-a	7712-7013 B18
22FR-31	7712-J701 FR1	22IPS-b	7712-7013 C18
22FR-32	7712-J701 FR3	22IPS-c	7712-7013 D18
22FR-33	7712-J701 FR4	22IPS-d	7712-7013 E18
22FR-34	7712-P701 FR2	22LP1-1	7712-7008 A18
22FR-35	7712-P701 FR1	22LP1-1a	7712-7008 B18 BLU
22FR-36	7712-P701 FR3	22LP1-1b	7712-7008 C18 BLU
22FR-37	7712-P701 FR4	22LP1-1c	7712-7008 D18 BLU
22FR-38	7712-J706 FR2	22LP1-2	7712-7009 A18
22FR-39	7712-J706 FR1	22LP1-2a	7712-7009 B18 RED
22FR-40	7712-J706 FR3	22LP1-2b	7712-7009 C18 RED
22FR-41	7712-J706 FR4	22LP1-2c	7712-7009 D18 RED
22FR-42	7712-P706 FR2	22LP2-3	7712-7002 A18
22FR-43	7712-P706 FR1	22LP2-3a	7712-7002 B18 RED
22FR-44	7712-P706 FR3	22LP2-3b	7712-7002 C18 RED
22FR-45	7712-P706 FR4	22LP2-3c	7712-7002 D18 RED
22FR-46	9811-TB700 FR5	22LP2-4	7712-7003 A18
22FR-47	9811-TB700 FR4	22LP2-4a	7712-7003 B18 BLU
22FR-48	9811-TB700 FR6	22LP2-4b	7712-7003 C18 BLU
22FR-49	9811-TB700 FR7	22LP2-4c	7712-7003 D18 BLU
22FR-50	9811-TB700 FR8	22LPS	7712-7004 A18
22FR-51	9811-TB707 FR4	22LPS-a	7712-7004 B18
22FR-52	9811-TB707 FR3	22LPS-b	7712-7004 C18
		22LPS-c	7712-7004 D18
		22LPS-d	7712-7004 E18

Key to Fig.19 (Sheet 1)

EFFECTIVITY: ALL

050B

2A

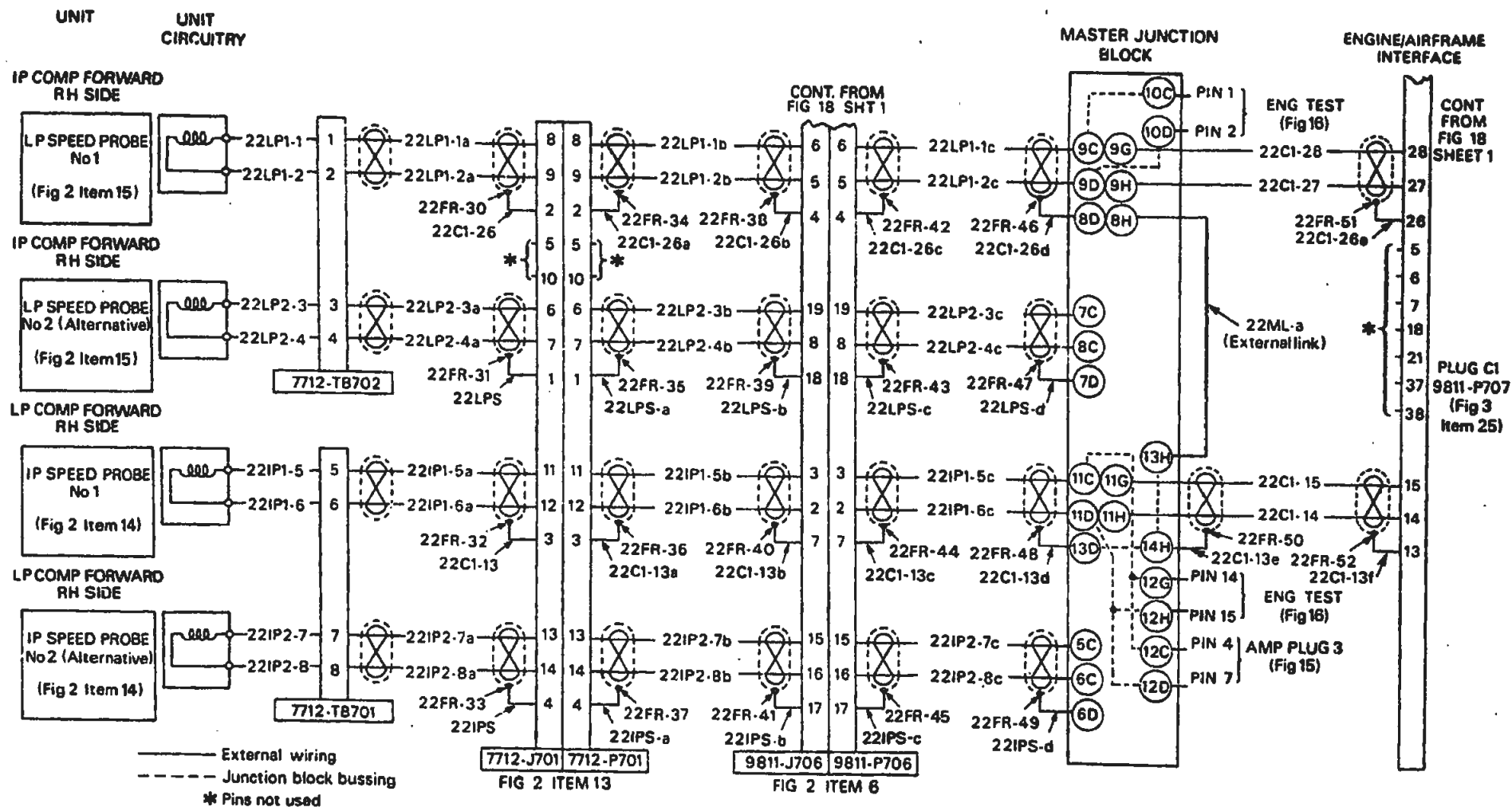
71-50-00

Page 140
Nov 15/89



RB.211 Propulsion System

MAINTENANCE



94708

Propulsion system wiring diagram (S.B.71-3641 and Pre S.B.72-3732)
Fig.19 (Sheet 1)

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 141/142
Nov 15/89

R-R Data
Page 98.45
Nov.15/89



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 143
Nov 15/89



RB.211 Propulsion System

MAINTENANCE

Code	Identification	Code	Identification
22C1-13	7712-7007 A18	22LP1-1	7712-7008 A18
22C1-13a	7712-7007 B18	22LP1-1a	7712-7008 B18 BLU
22C1-13d	7712-7007 E18	22LP1-1b	7712-7008 C18 BLU
22C1-13e	7712-7007 F18	22LP1-2	7712-7009 A18
22C1-13f	7712-7007 G18	22LP1-2a	7712-7009 B18 BLU
22C1-14	7712-7006 F18 RED	22LP1-2b	7712-7009 C18 BLU
22C1-15	7712-7005 F18 RED	22LP2-3	7712-7002 A18
22C1-26	7712-7010 A18	22LP2-3a	7712-7002 B18 RED
22C1-26a	7712-7010 B18	22LP2-3b	7712-7002 C18 RED
22C1-26d	7712-7010 E18	22LP2-4	7712-7003 A18
22C1-26e	7712-7010 F18	22LP2-4a	7712-7003 B18 BLU
22C1-27	7712-7009 F19 RED	22LP2-4b	7712-7003 C18 BLU
22C1-28	7712-7008 F18 BLU	22LPS	7712-7004 A18
22FR-30	7712-J701 FR2	22LPS-a	7712-7004 B18
22FR-31	7712-J701 FR1	22LPS-d	7712-7004 E18
22FR-32	7712-J701 FR3		
22FR-33	7712-J701 FR4		
22FR-34	7712-P701 FR2		
22FR-35	7712-P701 FR1		
22FR-36	7712-P701 FR3		
22FR-37	7712-P701 FR4		
22FR-46	9811-TB700 FR5		
22FR-47	9811-TB700 FR4		
22FR-48	9811-TB700 FR6		
22FR-49	9811-TB700 FR7		
22FR-50	9811-TB700 FR8		
22FR-51	9811-TB707 FR4		
22FR-52	9811-TB707 FR3		
22IP1-5	7712-7005 A18		
22IP1-5a	7712-7005 B18 RED		
22IP1-5b	7712-7005 C18 RED		
22IP1-6	7712-7006 A18		
22IP1-6a	7712-7006 B18 BLU		
22IP1-6b	7712-7006 C18 BLU		
22IP2-7	7712-7011 A18		
22IP2-7a	7712-7011 B18 BLU		
22IP2-7b	7712-7011 C18 BLU		
22IP2-8	7712-7012 A18		
22IP2-8a	7712-7012 B18 BLU		
22IP2-8b	7712-7012 C18 BLU		
22IPS	7712-7013 A18		
22IPS-a	7712-7013 B18		
22IPS-d	7712-7013 C18		

Key to Fig.19 (Sheet 2)

EFFECTIVITY: ALL

050B

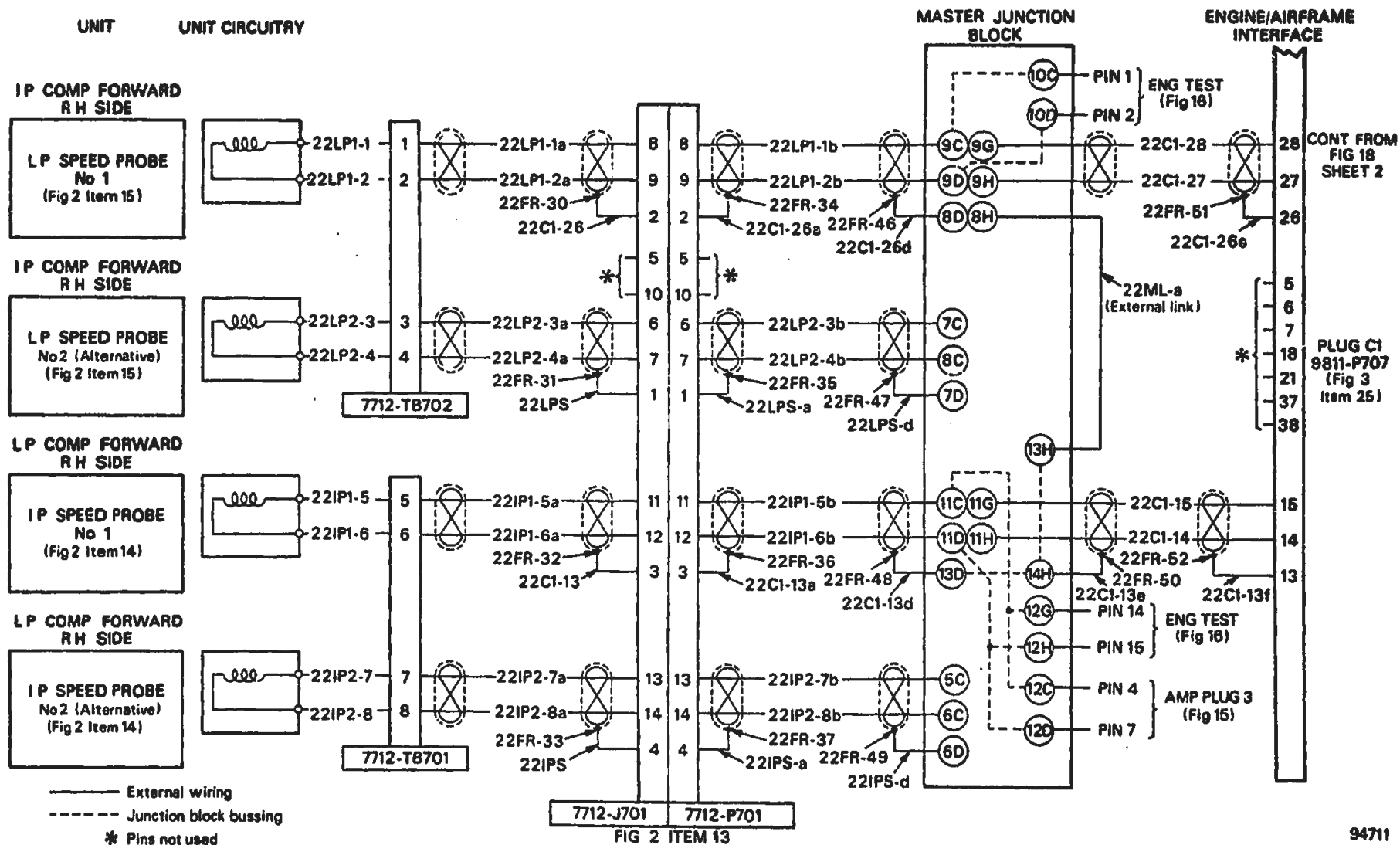
2A

71-50-00
Page 144
Nov 15/89



RB.211 Propulsion System

MAINTENANCE



Propulsion system wiring diagram (S.B.71-3641 and S.B.72-3732)
Fig.19 (Sheet 2)

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 145/146
Nov 15/89

94711

R-R Data
Page 98.49
Nov.15/89



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 147
Nov 15/89



RB.211 Propulsion System

MAINTENANCE

Code	Identification
22C1-32c	8011-7017 A18
22C2-1	7722-7002 A18
22C2-1a	7722-7002 B18
22C2-2	7722-7003 A18
22C2-2a	7722-7003 B18
22C2-3	3611-7006 A18
22C2-3a	3611-7006 B18
22C2-6	7831-7011 A18
22C2-6a	7831-7011 B18
22C2-9	7722-7000 A18
22C2-9a	7722-7000 B18
22C2-16	8011-7013 A18
22C2-17	8011-7014 A18
22C2-18	8011-7015 A18
22C2-19	8011-7016 A18
22E-8b	3611-7007 A18
22E-8c	3611-7007 B18
22E-36r	7831-7012 A18
22E-36s	3611-7005 A18
22E-36t	3611-7005 B18
22E-36u	7831-7012 B18
22C2-12	7722-7001 A18
22C2-12a	7722-7001 B18

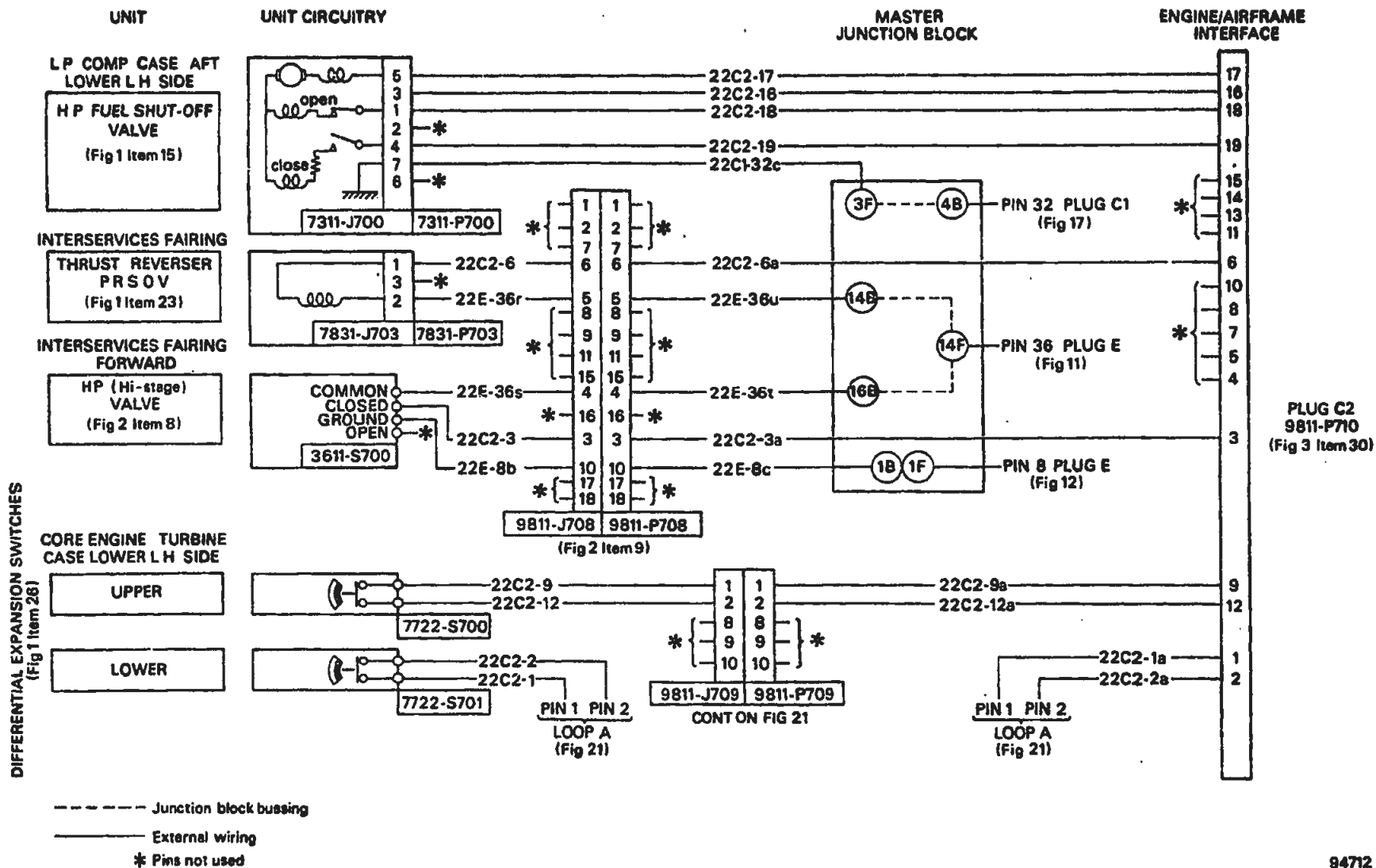
Key to Fig.20 (Sheet 1)

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 148
Nov 15/89



Propulsion system wiring diagram (Pre S.B.72-3732)
Fig.20 (Sheet 1)

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 149/150
Nov 15/89

94712



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 151
Nov 15/89

 RB.211 Propulsion System
MAINTENANCE

Code	Identification
C1-32c	8011-7017 A18
22C2-1	7722-7002 A18
22C2-2	7722-7003 A18
22C2-3	3611-7006 A18
22C2-6	7831-7011 A18
22C2-9	7722-7000 A18
22C2-12	7722-7001 A18
22C2-16	8011-7013 A18
22C2-17	8011-7014 A18
22C2-18	8011-7015 A18
22C2-19	8011-7016 A18
22E-8b	3611-7007 A18
22E-36r	7831-7012 A18
22E-36s	3611-7005 A18

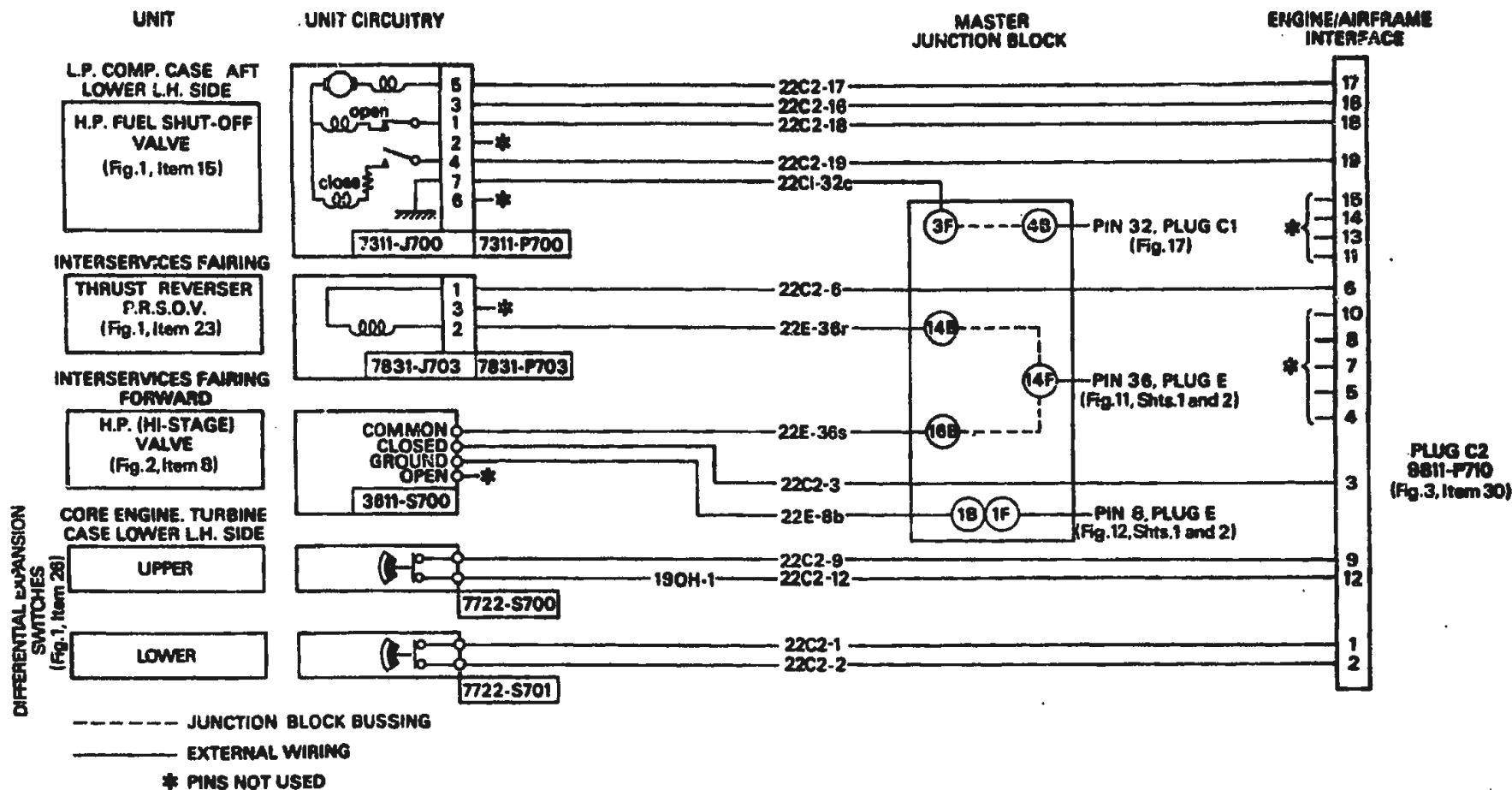
Key to Fig.20 (Sheet 2)

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 152
Nov 15/89



Propulsion system wiring diagram (S.B.72-3732)
Fig.20 (Sheet 2)

EFFECTIVITY: ALL

71-50-00
Page 153/154
Nov 15/89

R-R Data
Page 98.57
Nov.15/89



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 155
Nov 15/89



MAINTENANCE

Code	Identification
22D1-1	2611-7006 A18
22D1-2	2611-7006 H18
22D1-3	2611-7014 A18
22D1-5	3622-7000 C18
22D1-6	3622-7000 F18
22D1-7	3622-7001 C18
22D2-1	2611-7019 A18
22D2-2	2611-7019 H18
22D2-3	2611-7014 H18
22D2-5	3622-7002 C18
22D2-6	3622-7002 F18
22D2-7	3622-7001 F18
22GS-1	2611-7014 B18
22GS-1a	2611-7014 C18
22GS-1b	2611-7014 D18
22GS-1c	2611-7014 E18
22GS-1d	2611-7014 F18
22GS-2	3622-7001 B18
22GS-2a	3622-7001 A18
22GS-3	3622-7001 E18
22GS-3a	3622-7001 D18
22LA-a	3622-7000 D18
22LA-b	3622-7000 A18
22LA-c	3622-7000 B18
22LA-d	3622-7000 E18
22LB-a	3622-7002 D18
22LB-b	3622-7002 A18
22LB-c	3622-7002 B18
22LB-d	3622-7022 E18
22L1-a	2611-7006 G18
22L1-b	2611-7006 E18
22L1-c	2611-7006 D18
22L1-d	2611-7006 C18
22L1-e	2611-7006 B18
22L1-f	2611-7006 F18
22L2-a	2611-7019 G18
22L2-b	2611-7019 E18
22L2-c	2611-7019 D18
22L2-d	2611-7019 C18
22L2-e	2611-7019 B18
22L2-f	2611-7019 F18
22Z0-a	3622-A700
22Z0-b	3622-A701

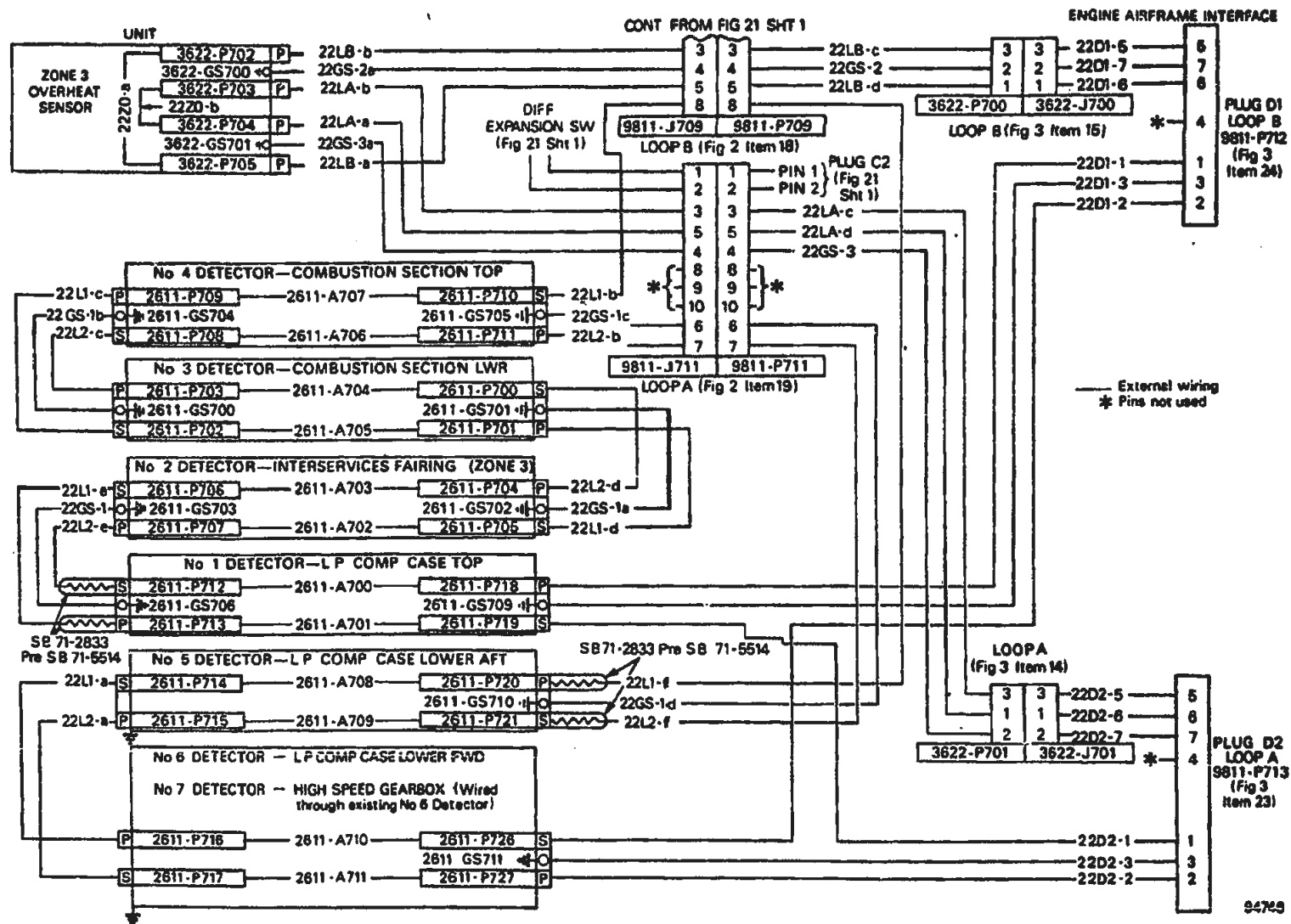
Key to Fig.21 (Sheet 1)

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 156
Nov 15/89



Propulsion system wiring diagram (Pre S.B.72-3732)
Fig.21 (Sheet 1)

EFFECTIVITY: ALL

2A

71-50-00
Page 157/158
Nov 15/89

R-R Data
Page 98.61
Nov.15/89



RB-211 Propulsion System MAINTENANCE

This page left blank intentionally

EFFECTIVITY: ALL

0508

2A

71-50-00
Page 159
Nov 15/89



MAINTENANCE

Identification

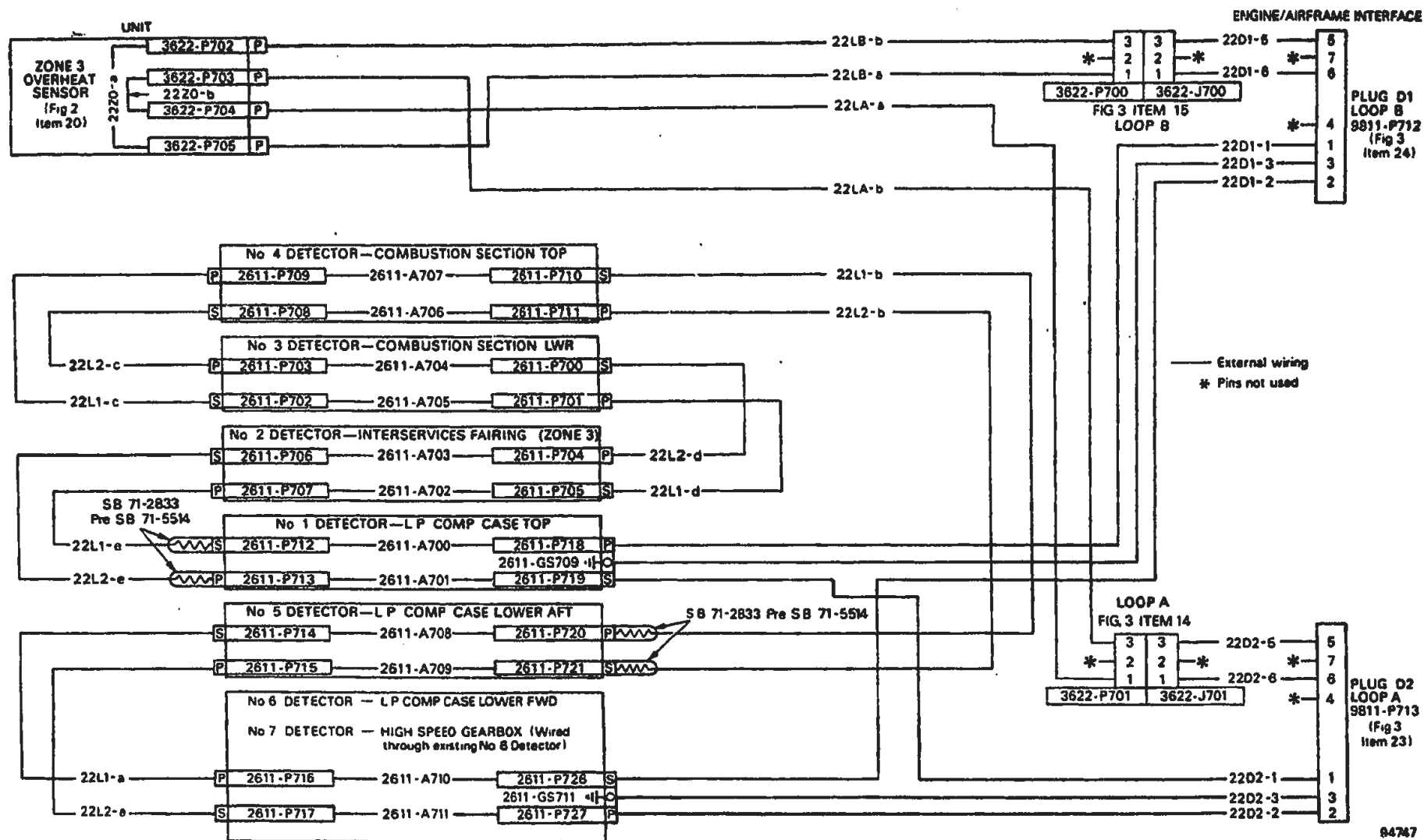
2611-7006	A18
2611-7006	H18
2611-7014	A18
3622-7000	C18
3622-7000	F18
2611-7019	A18
2611-7019	H18
2611-7014	H18
3622-7002	C18
3622-7002	F18
3622-7000	D18
3622-7000	A18
3622-7002	D18
3622-7002	A18
2611-7006	G18
2611-7006	E18
2611-7006	D18
2611-7006	C18
2611-7006	B18
2611-7019	G18
2611-7019	E18
2611-7019	D18
2611-7019	C18
2611-7019	B18
3622-A700	
3622-A701	

Key to Fig.21 (Sheet 2)



RB.211 Propulsion System

MAINTENANCE



84747

Propulsion system wiring diagram (S.B.72-3732)
Fig.21 (Sheet 2)

71-50-00
Page 161/162
Nov 15/89

EFFECTIVITY: ALL

2A

050B

R-R Data
Page 98.65
Nov. 15/89



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 163
Nov 15/89



BB.211 Propulsion System

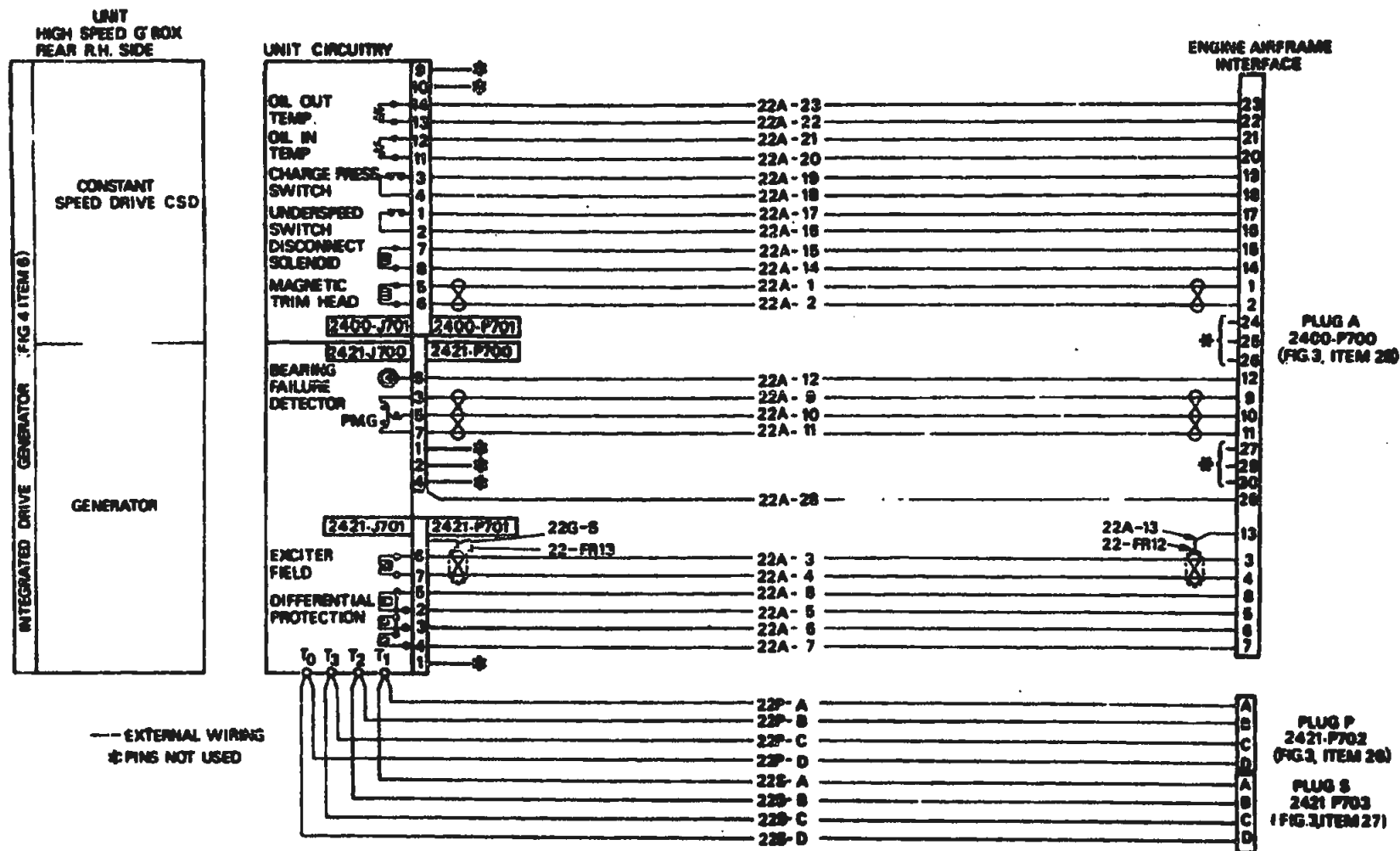
MAINTENANCE

Code	Indentification
22A-1	2411-7008 A18 BLU (S.B.24-2750 RED)
22A-2	2411-7009 A18 RED (S.B.24-2750 BLU)
22A-3	2421-7007 A18 BLU
22A-4	2421-7008 A18 RED
22A-5	2421-7012 A18
22A-6	2421-7011 A18
22A-7	2421-7010 A18
22A-8	2421-7009 A18
22A-9	2421-7003 A18 YEL (S.B.24-2750 RED)
22A-10	2421-7004 A18 BLU (S.B.24-2750 YEL)
22A-11	2421-7005 A18 RED (S.B.24-2750 BLU)
22A-12	2421-7002 A18
22A-13	2421-7021 B18
22A-14	2411-7007 A18
22A-15	2411-7006 A18
22A-16	2421-7001 A18
22A-17	2421-7000 A18
22A-18	2411-7005 A18
22A-19	2411-7004 A18
22A-20	2411-7003 A18
22A-21	2411-7002 A18
22A-22	2411-7001 A18
22A-23	2411-7000 A18
22A-28	2421-7006 A18
22-FR12	2421-P700 FR1
22-FR13	2421-P701 FR1
22G-S	2421-7021 A18
22P-A	2421-7016A4A RED
22P-B	2421-7014A4B YEL
22P-C	2421-7015A4C BLU
22P-D	2421-7013A6N WHT
22PS-A	2421-7020A4A RED
22S-B	2421-7018A4B YEL
22S-C	2421-7019A4C BLU
22S-D	2421-7017A6N WHT

Key to Fig.22



MAINTENANCE



Propulsion system wiring diagram
Fig.22

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 165/166
Nov 15/89

38808

R-R Data
Page 98.69
Nov.15/89



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 167
Nov 15/89



RB.211 Propulsion System

MAINTENANCE

Code	Identification
22M-1	3132-7010 A18
22M-2	3132-7011 A18
22M-3	3132-7008 A18
22M-4	3132-7009 A18
22M-5	3132-7014 A18
22M-6	3132-7015 A18
22M-7	3132-7013 A18
22M-8	3132-7012 A18
22M-35	3132-7007 A18
22M-36	3132-7006 A18
22TL-1	3132-7000 A18
22TL-2	3132-7001 A18
22TL-3	3132-7002 A18
22TL-4	3132-7003 A18
22TL-5	3132-7004 A18
22TL-6	3132-7005 A18

Key to Fig.23

EFFECTIVITY: ALL

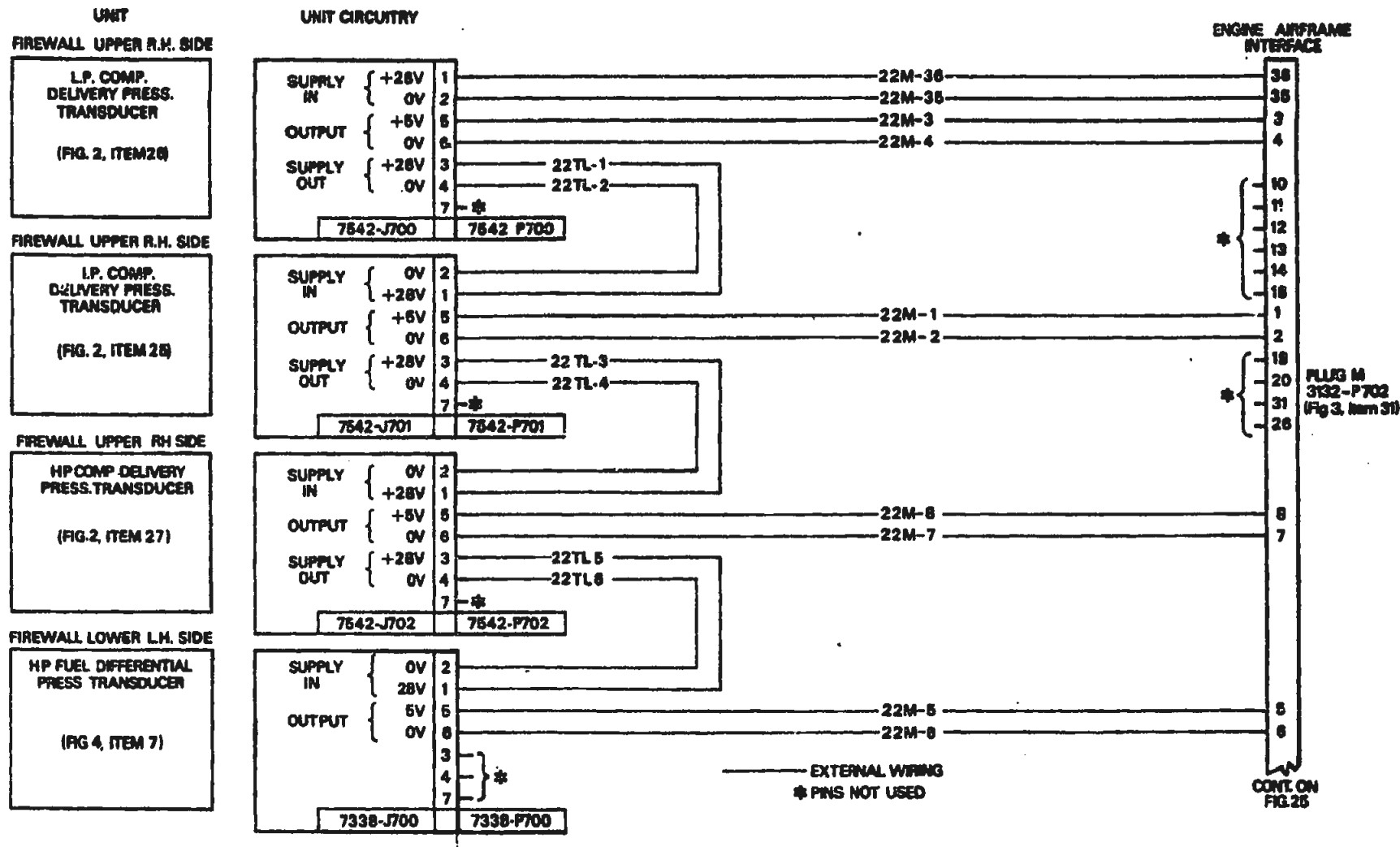
050B

2A

71-50-00
Page 168
Nov 15/89



MAINTENANCE



30003A

Propulsion system wiring diagram (S.B.77-2071)
Fig.23

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 169/170
Nov 15/89

R-R Data
Page 98.73
Nov.15/89



RB.211 Propulsion System

MAINTENANCE

This page left blank intentionally

EFFECTIVITY: ALL

050B

2A

71-50-00
Page 171
Nov 15/89

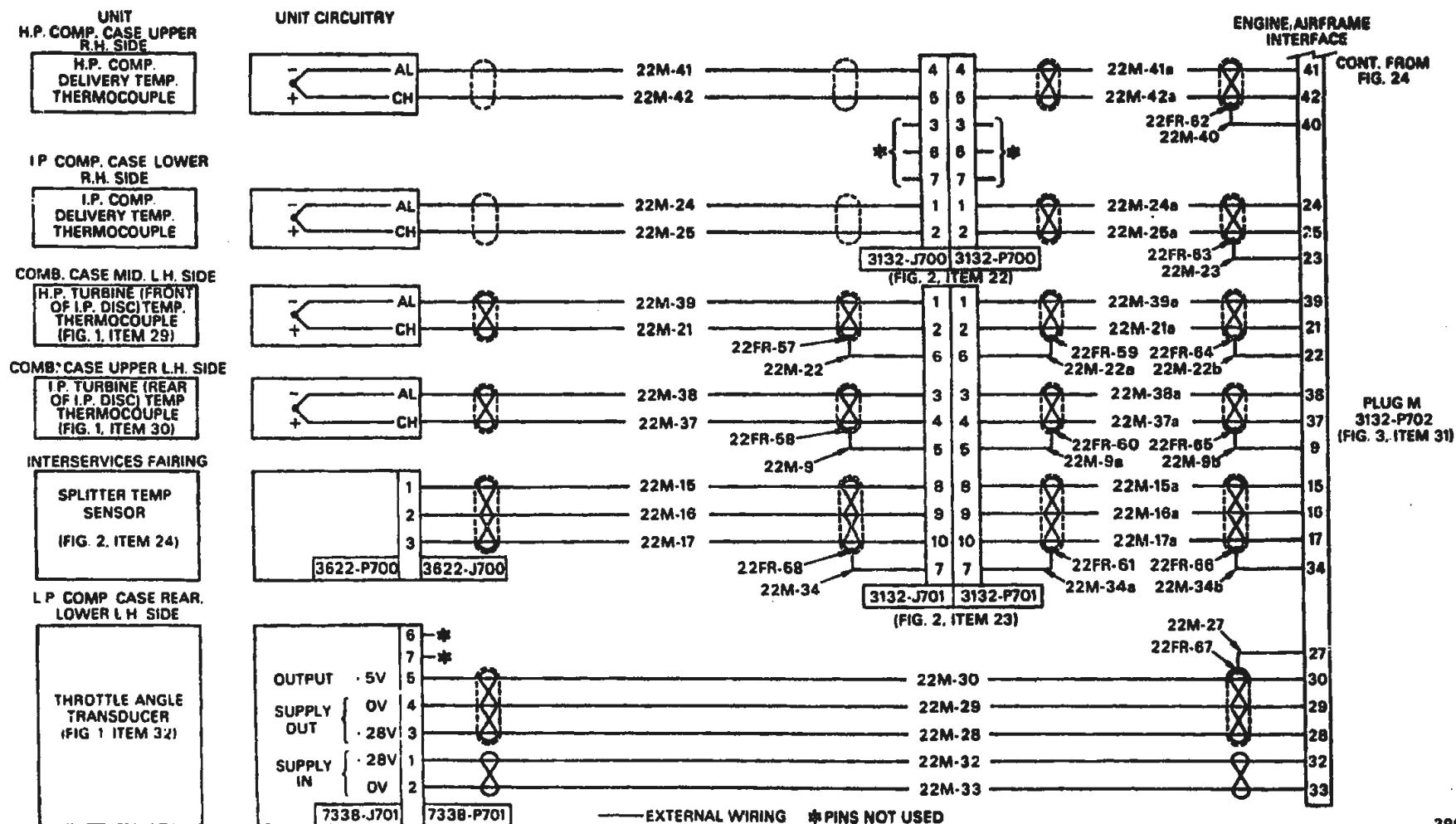
Propulsion System
MAINTENANCE

Identification		Code	Identification
1-57	3132-J701 FR1	22M-40	3132-7027 A18
1-58	3132-J701 FR2	22M-41	3132-7025B-ALML
1-59	3132-P701 FR1	22M-41a	3132-7025A-ALML
1-60	3132-P701 FR2	22M-42	3132-7026B-CHROM
1-61	3132-P701 FR3	22M-42a	3132-7026A-CHROM
1-62	3132-P702 FR3		
1-63	3132-P702 FR2		
1-64	3132-P702 FR4		
1-65	3132-P702 FR5		
1-66	3132-P702 FR6		
1-67	3132-P702 FR1		
-9	3132-7031 C18		
-9a	3132-7031 B18		
-9b	3132-7031 A18		
-15a	3132-7034 A18 RED		
-16a	3132-7035 A18 BLU		
-17a	3132-7036 A18 YEL		
-21	3132-7029B-CHROM		
-21a	3132-7029A-CHROM		
-22	3132-7030 C18		
-22a	3132-7030 B18		
-22b	3132-7030 A18		
-23	3132-7024 A18		
-24	3132-7022B-ALML		
-24a	3132-7022A-ALML		
-25	3132-7023B-CHROM		
-25a	3132-7023A-CHROM		
-27	3132-7016 A18		
-28	3132-7019 A18 RED		
-29	3132-7018 A18 BLU		
-30	3132-7017 A18 YEL		
-32	3132-7020 A18 RED		
-33	3132-7021 A18 BLU		
-34a	3132-7037 B18		
-34b	3132-7037 C18		
-37	3132-7033B-CHROM		
-37a	3132-7033A-CHROM		
-38	3132-7032B-ALML		
-38a	3132-7032A-ALML		
-39	3132-7028B-ALML		
-39a	3132-7028A-ALML		

Key to Fig.24



MAINTENANCE



Propulsion system wiring diagram (S.B.77-2071)
Fig.24

EFFECTIVITY: ALL

71-50-00
Page 173/174
Nov 15/89

2A

39665A



RB.211 Propulsion System

MAINTENANCE

ENGINE LIGHT DUTY ELECTRICAL HARNESS - REMOVAL/INSTALLATION

CAUTION: ENSURE ELECTRICAL CONNECTORS ARE FREE FROM LIQUID AND/OR SOLID CONTAMINATION BEFORE DISCONNECTING/RECONNECTING. FAILURE TO DO SO COULD RESULT IN A FIRE.

1. Removal/Installation Master Junction Block Assembly

Service Bulletins referred to:

78-3753 - Translating Cowl Stowed Indication Junction Block

Referenced Procedures:

71-11-00	Cowling, Engines No.1 and No.3 - Servicing
71-12-05	L.H. and R.H. Upper Hinged Cowls - Servicing
71-50-01	Engine Light Duty Electrical Harness - Adjustment/Test

Illustrated Parts Catalogue References:

The I.P.C. section where parts disturbed during the following operations can be located are as follows:

71-50-01 Engine Light Duty Electrical Harness - Engine
Test Services

A. Remove Master Junction Block Assembly

(1) Equipment required:

2103482 Insertion/extraction tool

(2) Disconnect ground power and tag external power receptacle.

(3) Ensure GND SERVICE switch, EXT POWER switch and BATTERY switch, zone 215, are in OFF position and tagged.

R
R
050B

EFFECTIVITY: ALL

1A

71-50-01
Page 401
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

- (4) Open left-hand hinged cowl 413A or 423A for engines No.1 and 3 (Ref. 71-11-00) or 433DL for engine No.2 (Ref. 71-12-05).
- (5) Refer to fig.401, using insertion/extraction tool remove all terminal contacts from junction block module terminals.
- (6) Remove junction block securing bolts and washers, then lift junction block off support bracket.

B. Install Master Junction Block Assembly

- (1) Equipment required:
2103482 Insertion/extraction tool
- (2) Ensure appropriate systems and switches are tagged as detailed in operations A.(2) and (3).
- (3) Refer to fig.402, insert module terminal sealing plugs in module terminals indicated.
- (4) Refer to fig.401, fit junction block to support bracket and secure with bolts and washers.
- (5) Using insertion/extraction tool insert each lead terminal contact into the appropriate junction block module terminal as indicated on the lead tag.
- (6) Test harness to junction block connections as detailed in 71-50-01 Adjustment/Test.
- (7) Close left-hand hinged cowl 413A or 423A for engines No.1 and 3 (Ref. 71-11-00) or 433DL for engine No.2 (Ref. 71-12-05).
- (8) Remove tags fitted in operations A.(2) and (3).

EFFECTIVITY: ALL

050B

1A

71-50-01
Page 402
Nov 15/87



BB.211 Propulsion System

MAINTENANCE

2. Removal/Installation Master Junction Block Module

Service Bulletins referred to:

R 71-3641 - Harness to Suit STA103 Amplifier

Referenced Procedures:

71-11-00 Cowling, Engines No.1 and No.3 - Servicing
71-12-05 L.H. and R.H. Upper Hinged Cowls - Servicing

Illustrated Parts Catalogue References:

The I.P.C. section where parts disturbed during the following operations can be located are as follows:

71-50-01 Engine Light Duty Electrical Harness - Engine Test Services

A. Remove Master Junction Block Module.

(1) Equipment required:

2103482 Insertion/extraction tool

(2) Disconnect ground power and tag external power receptacle.

(3) Ensure GND SERVICE switch, EXT POWER switch and BATTERY switch, zone 215, are in OFF position and tagged.

(4) Open left-hand hinged cowl 413A or 423A for engines No.1 and 3 (Ref. 71-11-00) or 433DL for engine No.2 (Ref. 71-12-05).

(5) Using insertion/extraction tool remove lead terminal contacts from module to be changed.

(6) Refer to fig.401, remove junction block securing bolts and washers.

EFFECTIVITY: ALL

050B

1A

71-50-01
Page 403
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

- (7) Refer to fig.403, remove outer (4 off) screws and washers (1) securing top plate (2).
- (8) Remove top plate (2). If module block to be changed is in lower row, also remove upper end blocks (4) and centre plate (5) off pillars (6).
- (9) Remove module block to be changed.

B. Install Master Junction Block Module

- (1) Equipment required:

2103482 Insertion/extraction tool

R

- (2) Refer to fig.402, insert module terminal sealing plugs into each side of replacement module at positions shown.
- (3) Fit module in correct position.
- (4) If module block being fitted to lower row refer to fig.403, fit centre plate (5) on pillars (6) with identification number 20 positioned at the top of junction block assembly.
- (5) Fit upper end blocks (4) on pillars (6) with identification letters E and F facing forward.
- (6) Fit upper module blocks on centre plate (5).
- (7) Fit top plate (2) on upper end blocks (4) secure with outer (4 off) screws and washers (1).
- (8) Refer to fig.401, secure junction block to support bracket with bolts and washers.
- (9) Using insertion/extraction tool insert lead terminal contacts into replacement module block positions indicated on the lead tags.

EFFECTIVITY: ALL

050B

1A

71-50-01
Page 404
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

- (10) Test appropriate module block connections as detailed in 71-50-01, Adjustment/Test.
- (11) Close left-hand hinged cowl 413A or 423A for engines No.1 and 3 (Ref. 71-11-00) or 433DL for engine No.2 (Ref. 71-12-05).
- (12) Remove tags fitted in operations A.(2) and (3).

R
R
050B

EFFECTIVITY: ALL

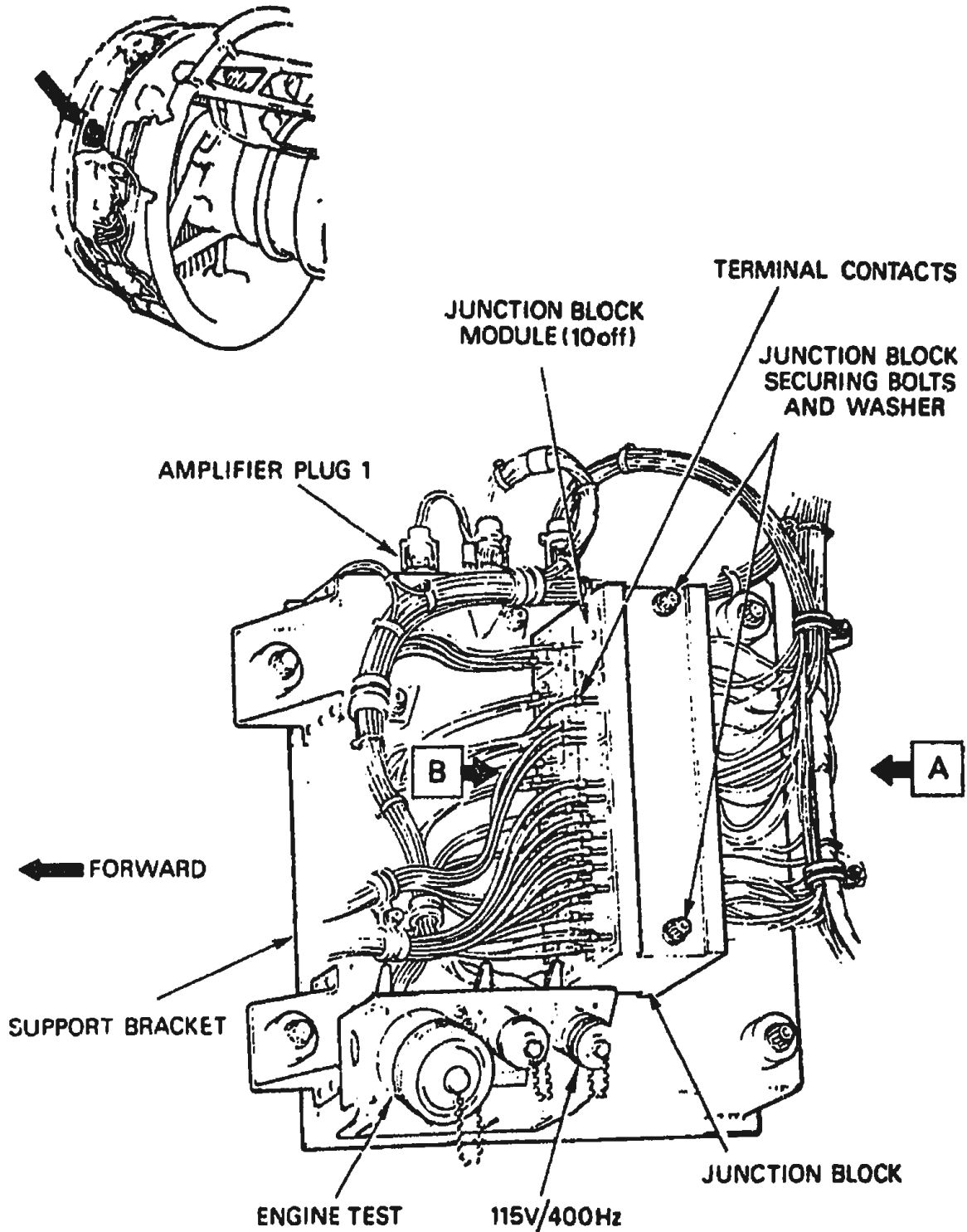
1A

71-50-01
Page 405
Nov 15/87



RB.211 Propulsion System

MAINTENANCE



26678A

Master junction block disconnect points
Fig.401

R
R

R
R

EFFECTIVITY: ALL

050B

1G

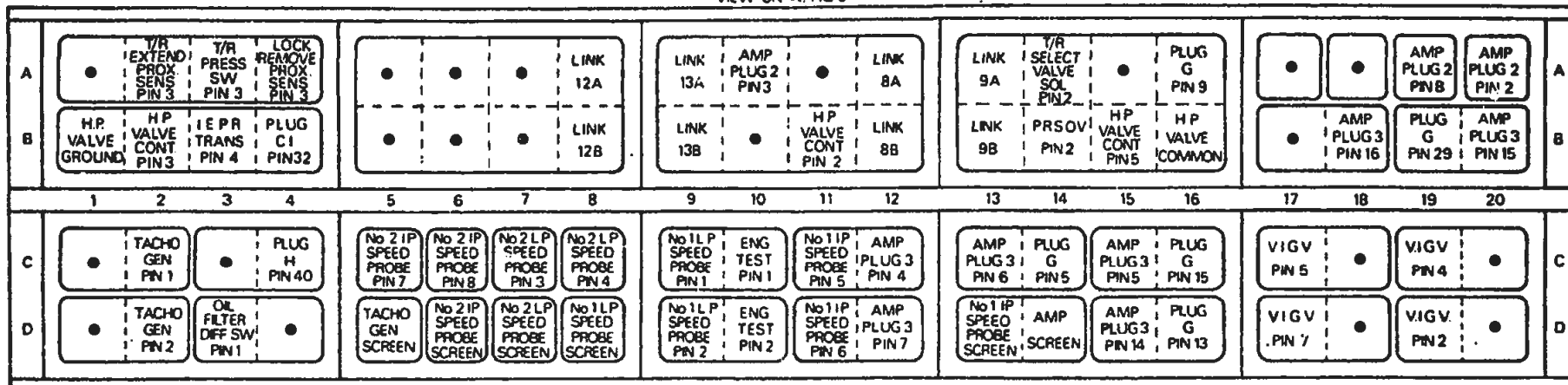
71-50-01
Page 406
Aug 15/77



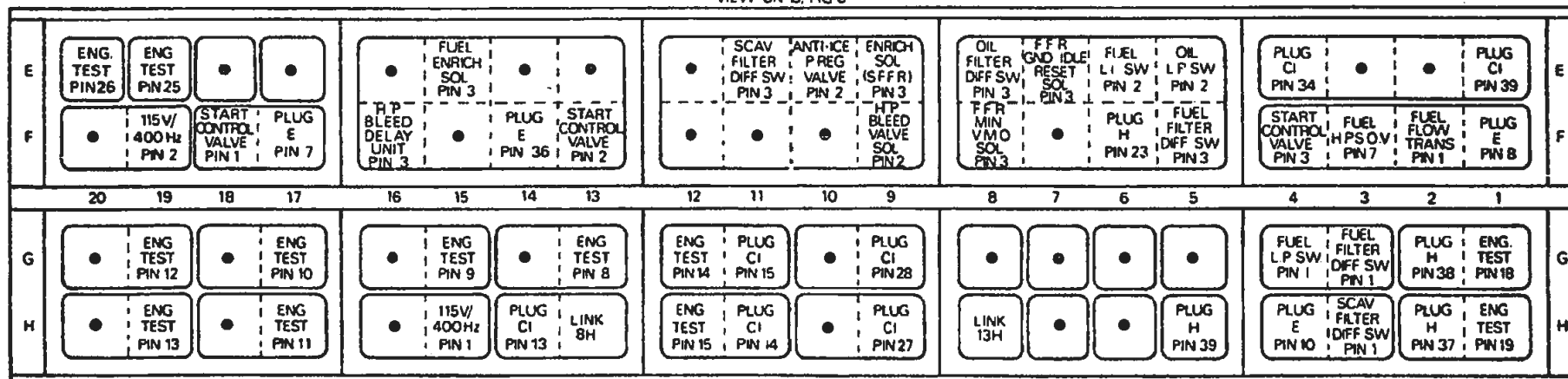
RB.211 Propulsion System

MAINTENANCE

VIEW ON A, FIG 6



VIEW ON B, FIG 6



NOTE 1 Solid lines define the internal bussing arrangement of each module block. Dotted lines are included to define individual module block connections.
2 Sealing plugs are fitted at positions indicated ●

32304

Junction block terminal reference and sealing plug positions
(S.B.71-3641)
Fig.402

EFFECTIVITY: ALL
R
050B

1A

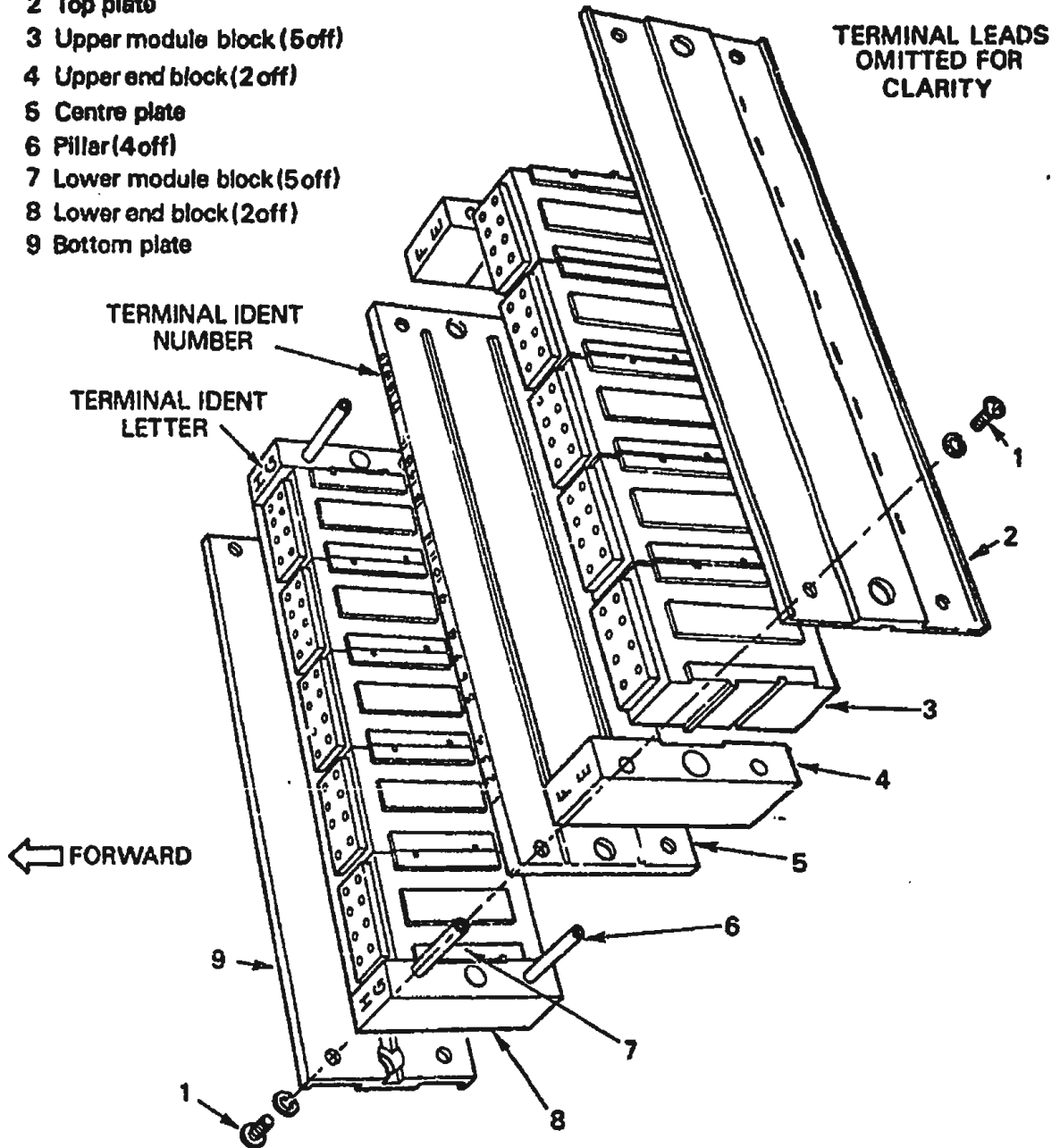
71-50-01
Page 407/408
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

- 1 Securing screw and washer (8 c/f)
- 2 Top plate
- 3 Upper module block (5 off)
- 4 Upper end block (2 off)
- 5 Centre plate
- 6 Pillar (4 off)
- 7 Lower module block (5 off)
- 8 Lower end block (2 off)
- 9 Bottom plate



37055

Module block removal/installation
Fig.403

R
R
050B

EFFECTIVITY: ALL

1A

71-50-01
Page 409
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

3. Removal/Installation Translating Cowl Stowed Indication Junction Block Module (S.B.78-3753)

Service Bulletins referred to:

72-4073 - Improved module, on locked and stowed translating cowl indication system.

Referenced Procedures:

71-11-00 Cowling, Engines No.1 and 3 - Servicing
71-12-05 L.H. and R.H. Upper Hinged Cowls - Servicing
71-50-01 Engine Light Duty Electrical Harness - Adjustment/Test

Illustrated Parts Catalogue References:

The I.P.C. sections where parts disturbed during the following operations can be located are as follows:

71-50-01 Engine Light Duty Electrical Harness - Engine Test Services.

A. Remove Translating Cowl Stowed Indication Junction Block Module

Engines without S.B.72-4073 module blocks are marked with black. Engines with S.B.72-4073 module blocks are marked with red.

(1) Equipment required:

2103482 Insertion/extraction tool

(2) Disconnect ground power and tag external power receptacle.

(3) Ensure GND SERVICE switch, EXT POWER switch and BATTERY switch, Zone 215, are in OFF position and tagged.

(4) Open left-hand hinged cowl 413A or 423A for engines No.1 and 3 (Ref. 71-11-00) or 433DL for engine No.2 (Ref. 71-12-05).

(5) Refer to fig.404, using insertion/extraction tool, remove all terminal contacts from junction block module (1) terminals.

R
R

050B

EFFECTIVITY: ALL

1A

71-50-01
Page 410
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

- (6) Release locking screw (2), slide locking plate (3) and module (1) out of position to limit of travel and then withdraw module from junction block.

B. Install Translating Cowl Stowed Indication Junction Block Module.

Engines without S.B.72-4073 module blocks are marked with black. Engines with S.B.72-4073 module blocks are marked with red.

- (1) Equipment required:
2103482 Insertion/extraction tool
- (2) Ensure appropriate systems and switches are tagged as detailed in operations A. (2) and (3).
- (3) Refer to fig.405, insert module terminal sealing plugs in module (1) terminals indicated.
- (4) Refer to fig.404, insert module (1) in junction block assembly (4); slide module into position and secure with locking plate (3) and screw (2)
- (5) Using insertion/extraction tool insert each lead terminal contact into the appropriate module terminal as indicated on lead tag.
- (6) Test harness to junction block connections as detailed in 71-50-01, Adjustment/Test.
- (7) Close left-hand hinged cowl 413A or 423A for engines No.1 and 3 (Ref. 71-11-00) or 433DL for engine No.2 (Ref. 71-12-05).
- (8) Remove tags fitted in operations A. (2) and (3).

R
R

EFFECTIVITY: ALL

050B

1A

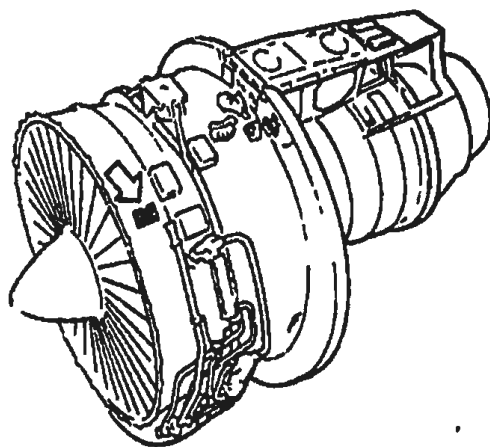
71-50-01

Page 411
Nov 15/87

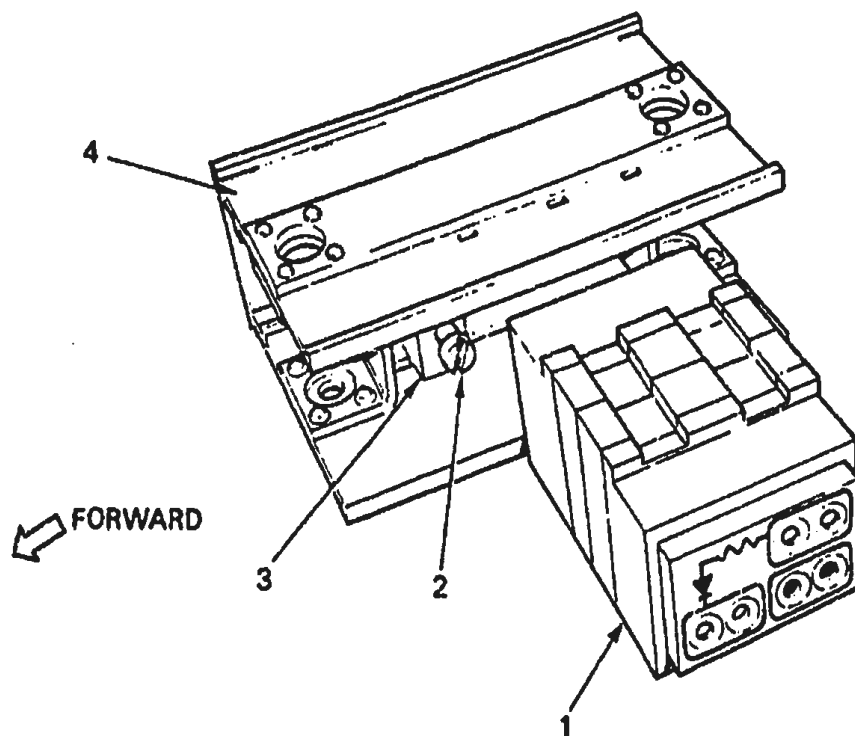


RB.211 Propulsion System

MAINTENANCE



- 1 Junction block module
- 2 Locking plate securing screw
- 3 Junction block locking plate
- 4 Junction block assembly



37058

Translating cowl stowed indication junction block -
Removal/Installation (S.B.78-3753)
Fig.404

R
R
050B

EFFECTIVITY: ALL

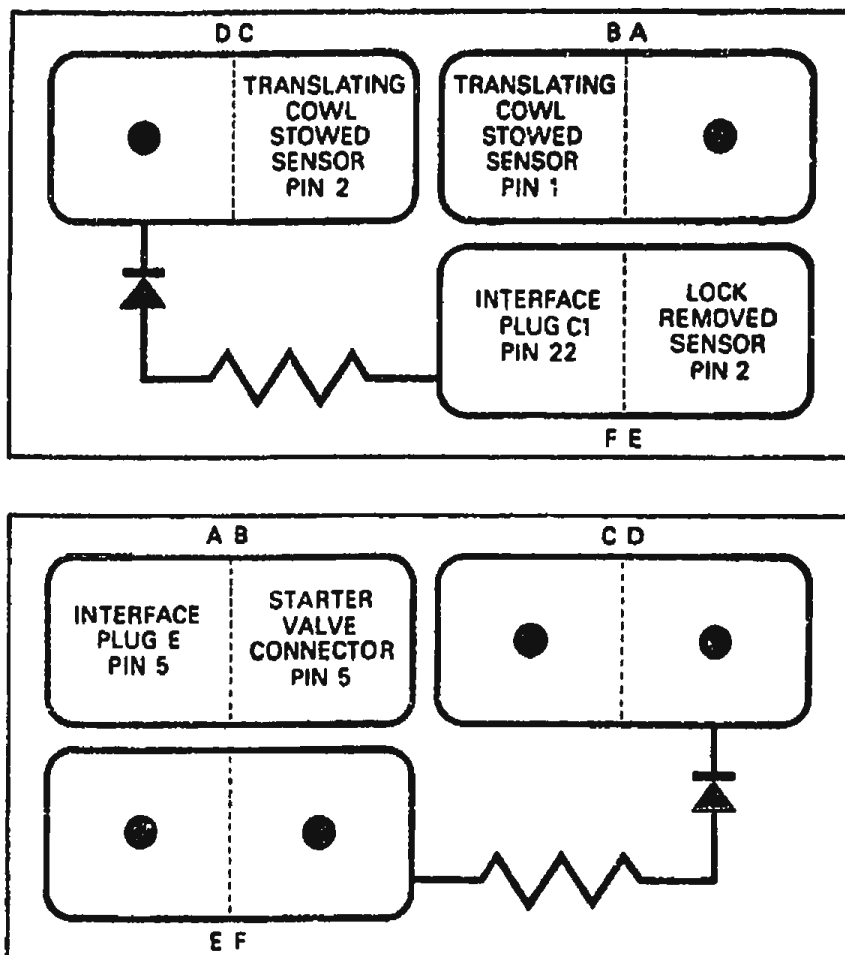
1A

71-50-01
Page 412
Nov 15/87



RB.211 Propulsion System

MAINTENANCE



- NOTE :
- 1 Solid lines define the internal bussing arrangements of the module. Dotted lines are included to define individual module connections
 - 2 Sealing plugs are fitted at positions indicated ●

37057

Translating cowl stowed indication junction block
terminal reference and sealing plug positions (S.B.78-3753)
Fig.405

R
R
050B

EFFECTIVITY: ALL

1A

71-50-01
Page 413/414
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

ENGINE LIGHT DUTY ELECTRICAL HARNESS - ADJUSTMENT/TEST

1. Master Junction Block - Adjustment/Test

R CAUTION: ENSURE ELECTRICAL CONNECTORS ARE FREE FROM LIQUID AND/OR
R SOLID CONTAMINATION BEFORE CONNECTING OR DISCONNECTING.

Service Bulletins referred to:

R 73-2864 - Lucas S.B. M.S.C.101-73-7 (Mod.CP.4506) Introduction
R of Redesigned Wiring Assembly for Enrichment Solenoid
71-3641 - Harness to Suit S.T.A.103 Amplifier
78-3753 - Translating Cowl Stowed Indication Junction Block

R In the following Lucas Mod.CP.4506 is referred to by the
R Rolls-Royce S.B. number.

Referenced Procedures:

6-40-00 Exterior Access Doors and Panels - Description
and Operation
71-11-00 Cowling, Engines No.1 and No.3 - Servicing
71-12-05 L.H. and R.H. Upper Hinged Cows - Servicing

Illustrated Parts Catalogue References:

The I.P.C. sections where parts disturbed during the following operations can be located are as follows:

71-50-01 Engine Light Duty Electrical Harness - Engine Test Services

A. Test Master Junction Block Assembly Connections

(1) Equipment required:

Avometer or similar test instrument (maximum voltage not greater than 15 volts).

EFFECTIVITY: ALL

0508

1E

71-50-01
Page 501
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

- (2) Disconnect ground power and tag external power receptacle.
- (3) Ensure GND SERVICE switch, EXT POWER switch and BATTERY switch, zone 215, are in OFF position and tagged.
- R (4) Remove aft nose fairing 451BT or 461BT (Ref.6-40-00).
- (5) Open left-hand hinged cowl 413A or 423A for engines No.1 and 3 (Ref. 71-11-00) or 433DL for engine No.2 (Ref. 71-12-05).
- (6) Disconnect the following electrical connectors at the engine/airframe interface:
- | | | |
|-----------|----|-------------|
| Connector | C1 | (9811-P707) |
| Connector | C2 | (9811-P710) |
| Connector | E | (9811-P703) |
| Connector | G | (9811-P704) |
| Connector | H | (9811-P701) |
- (7) Disconnect the following unit electrical connectors:
- Fuel filter differential pressure switch (Ref. 73-31-02)
Oil filter pressure differential switch (Ref. 79-31-02)
R Speed and temp. control amplifier plug 3 - S.B.71-3641
R Fine scavenge filter pressure differential switch (Ref. 79-31-11)
- (8) Remove dust covers from the following engine test connectors
- ENGINE TEST (9811-J705)
115V/400Hz (7321-J705)
- (9) Using Avometer effect all tests detailed in Table 1
- NOTE: Where reference is made in the table to a unit pin number e.g. Unit 3, the pin referred to is pin 3 of relevant unit harness connector.
- Where a reference such as H40 is made, the pin referred to is pin 40 of harness connector H.

EFFECTIVITY: ALL

050B

1E

71-50-01
Page 502
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

- (10) Connect electrical connectors disconnected in operations (6) and (7) ensuring looms do not obstruct the outlet of the fire extinguisher nozzle.
- R (11) Refit dust covers to the following engine test
R connectors
- R ENGINE TEST (9811-J705)
R 115V/400Hz (7321-J705)
- R (12) Fit aft nose fairing 451BT or 461BT (Ref.6-40-00).
- R (13) Close left-hand hinged cowl 413A or 423A for engines
No.1 and 3 (Ref. 71-11-00) or 433DL for engine No.2
(Ref. 71-12-05).
- R (14) Remove tags fitted in operations A. (2) and (3).

B. Test Individual Module Block Connections

- (1) Equipment required:
- Avometer or similar test instrument (maximum voltage not greater than 15 volts).
- (2) Disconnect ground power and tag external power receptacle.
- (3) Ensure GND SERVICE switch, EXT POWER switch and BATTERY switch, zone 215, are in OFF position and tagged.
- R (4) Remove aft nose fairing 451BT or 461BT (Ref.6-40-00).
- (5) Open left-hand hinged cowl 413A or 423A for engines No.1 and 3 (Ref. 71-11-00) or 433DL for engine No.2 (Ref. 71-12-05).

EFFECTIVITY: ALL

050B

1E

71-50-01
Page 503
Nov 15/87



BB.211 Propulsion System

MAINTENANCE

- (6) Refer to Table 2, using Avometer effect test applicable to replacement module block. Disconnect harness electrical connectors as necessary.

NOTE: Where reference is made in the table to a unit pin number e.g. Unit 1, the pin referred to is pin 1 of the harness connector that connects to the unit given in the right-hand column of the table.

Where a reference such as H40 is made, the pin referred to is pin 40 of harness connector H.

- (7) Reconnect electrical connectors disconnected in operation (6) ensuring looms at engine/airframe interface do not obstruct the outlet of the fire extinguisher nozzle.

R (8) Fit aft nose fairing 451BT or 461BT (Ref.6-40-00).

- (9) Close left hand hinged cowl 413A or 423A for engine No.1 and 3 (Ref. 71-11-00) or 433DL for engine No.2 (Ref. 71-12-05).

- (10) Remove tags fitted in operations B. (2) and (3).

R 2. List of abbreviations used in Tables 1 and 2

R F.F.R. - Fuel Flow Regulator
R S.F.F.R. - Starting Fuel Flow Regulator
R F.F.Diff.Press.Sw. - Fuel Filter Differential Pressure Switch
R F.Scav.F.Diff.Press.Sw. - Fine Scavenge Filter Differential
R Pressure Switch
R Oil F.Diff.Press.Sw. - Oil Filter Differential Pressure Switch
R Fuel F.Diff.Press.Sw. - Fuel Filter Differential Pressure Switch

EFFECTIVITY: ALL

050B

1E

71-50-01
Page 504
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

UNIT	CONNECTOR PIN		RESISTANCE (ohms)	JUNCTION BLOCK TERMINALS CHECKED
	From	To		
Fuel low pressure warning switch	H40	H23	less than 1	4C,4G,6E,6F
Low oil pressure warning switch	H25	E36	less than 1	5E,8A,12A,
	H25	G9	less than 1	9A,13A,8B,12B, 9B,13B,14F,16A
H.P. tachometer generator	H37	H38	8 to 10	2H,2D,2C,2G,
	ENG TEST 18	ENG TEST 19	8 to 10	1G,2C,1H,2D
Fuel filter differential pressure switch	H23	Unit 3	less than 1	6F,5F
	H40	Unit 1	less than 1	4C,3G
Anti-ice pressure regulator/shut-off valve	E42	E36	16.5 to 19.5	10E,14F
Starter air valve	E7	E36	18 to 22	13F,14F
	E8	Unit case	less than 1	1F,4F
Starter air valve (S.B.71-3641)	E7	E36	18 to 22	13F,14F,17F,18F
	E8	Unit case	less than 1	1F,4F
Oil filter pressure differential switch	E36	Unit 3	less than 1	14F,8E
	E10	Unit 1	less than 1	4H,3D
Fine scavenge filter differential pressure switch	E36	Unit 3	less than 1	14F,11E
	E10	Unit 1	less than 1	4H,3H
Fuel enrichment solenoid	E26	E36	8 to 10	15E,14F
Fuel enrichment solenoid (S.B.73-2864)	E26	E36	8 to 12	15E,14F

94778

R
R

Master junction block test
Table 1 (Sheet 1)

EFFECTIVITY: ALL

050B

1E

71-50-01

Page 505
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

UNIT	CONNECTOR PIN		RESISTANCE (ohms)	JUNCTION BLOCK TERMINALS CHECKED
	From	To		
F.F.R. min. V.M.O. solenoid	E27	E36	8 to 12	8F,14F
S.F.F.R. enrichment solenoid and P4/PF switch	E28	E36	8 to 13	9E,14F
F.F.R. ground idle reset solenoid	E25	E36	8 to 13	7E,14F

94779

R Master junction block test - Without S.B.71-4176 and S.B.71-5474
R Table 1 (Sheet 2)

EFFECTIVITY: ALL

71-50-01

Page 506
Nov 15/87

050B

1E



RB.211 Propulsion System

MAINTENANCE

UNIT	CONNECTOR PIN		RESISTANCE (ohms)	JUNCTION BLOCK TERMINALS CHECKED
	From	To		
F.F.R. min. V.M.O. solenoid and P4/PF switch	E28	E36	8 to 13	8F,14F
S.F.F.R. enrichment solenoid	E27	E36	8 to 13	9E,14F
F.F.R. ground idle reset solenoid	E25	E36	8 to 13	7E,14F

94780

R
R

Master junction block test - With S.B.71-4176
Table 1 (Sheet 3)

EFFECTIVITY: ALL

050B

1E

71-50-01
Page 507
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

UNIT	CONNECTOR PIN		RESISTANCE (ohms)	JUNCTION BLOCK TERMINALS CHECKED
	From	To		
H.P. bleed valve control unit	E16	E36	23 to 28	9F,14F
Fuel H.P. shut-off valve	C ₁ 32	Unit case	less than 1	4B,3F
Fuel flow transmitter	E8	Unit case	less than 1	1F,2F
H.P. valve controller	G3	G9	28 to 32 or 44 to 49	11B,16A
	G23	G9	47 to 60 or 49 to 54	15B,16A
	C ₁ 32	Unit case	less than 1	4B,2B

94781

R
R

Master junction block test - Without S.B.71-5474
Table 1 (Sheet 4)

EFFECTIVITY: ALL

050B

1E

71-50-01
Page 508
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

UNIT	CONNECTOR PIN		RESISTANCE (ohms)	JUNCTION BLOCK TERMINALS CHECKED
	From	To		
P4/PF switch and HP3 bleed control valve solenoid	E28	E36	23 to 29	9F,14F
S.F.F.R. enrichment solenoid	E16	E36	8 to 13	9E,14F
F.F.R. min V.M.O. solenoid	E27	E36	8 to 13	8F,14F

94782

R Master junction block test - With S.B.71-5474 without S.B.71-4176
R Table 1 (Sheet 5)

EFFECTIVITY: ALL

050B

1E

71-50-01
Page 509
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

UNIT	CONNECTOR PIN		RESISTANCE (ohms)	JUNCTION BLOCK TERMINALS CHECKED
	From	To		
P4/PF switch and HP3 bleed control valve solenoid	E28	E36	23 to 29	9F, 14F
S.F.F.R. enrichment solenoid	E27	E36	8 to 13	9E, 14F
F.F.R. min V.M.O. solenoid	E16	E36	8 to 13	8F, 14F

94783

R Master junction block test - With S.B.71-5474 and S.B.71-4176
R Table 1 (Sheet 6)

EFFECTIVITY: ALL

0508

1E

71-50-01

Page 510
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

UNIT	CONNECTOR PIN		RESISTANCE (ohms)	JUNCTION BLOCK TERMINALS CHECKED
	From	To		
Speed and temp. control amplifier (SB.71-3351)	G13	G29	10 to 12	16D, 15D, 20B, 19B
	G5	G15	5000 to 10000	14C, 13C, 15C, 16C
	115V/400Hz 1	115V/400Hz 2	10 to 12	15H, 15D, 20B, 19F
	ENG TEST 8	ENG TEST 9	5000 to 10000	13G, 13C, 15C, 15G
V.I.G.V. control position transducer	ENG TEST 10	ENG TEST 11	4 to 5	17G, 17C, 17D, 17H
	ENG TEST 12	ENG TEST 13	4 to 5	19G, 19C, 19D, 19H
I.E.P.R. transmitter	C ₁ 32	C ₁ 42	less than 1	3B, 4B

94784

R
R

Master junction block test
Table 1 (Sheet 7)

EFFECTIVITY: ALL

050B

1E

71-50-01
Page 511
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

UNIT	CONNECTOR PIN		RESISTANCE (ohms)	JUNCTION BLOCK TERMINALS CHECKED
	From	To		
Speed and temp. control amplifier (SB.71-3641)	G13	G29	10 to 12	16D,15D,20R, 19R
	G5	G15	5000 to 10000	14C,13C,15C, 16C
	115V/400Hz 1	115V/400Hz 2	10 to 12	15H,15D,20H, 19F
	ENG TEST 8	ENG TEST 9	5000 to 10000	13G,13C,15C, 15G
	ENG TEST 25	ENG TEST 26	7000 to 9000	19A,19E,20A, 20E
	DISCONNECT AMP. PLUG 2 AND PLUG 3 CONNECTORS			
	UNIT 4	ENG.TEST PIN 14	less than 1	12C,12G
	UNIT 7	ENG.TEST PIN 15	less than 1	12D,12H
	AMP.PLUG 3 PIN 16	E7	less than 1	18B,17F
	AMP.PLUG 2 PIN 3	E36	less than 1	10A,14F
	RECONNECT AMP. PLUG 2 and PLUG 3 CONNECTORS			

94785

R
R

Master junction block test
Table 1 (Sheet 8)

EFFECTIVITY: ALL

050B

1E

71-50-01
Page 512
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

UNIT	CONNECTOR PIN		RESISTANCE (ohms)	JUNCTION BLOCK TERMINALS CHECKED
	From	To		
L.P. speed probe (SB.71-3351, SB.71-3641)	C ₁ 27	C ₁ 28	1.75 to 2.5	9H, 9D, 9G, 9C
	ENG TEST 1	ENG TEST 2	1.75 to 2.5	10C, 9C, 9D, 10D
I.P. speed probe	ENG TEST 14	ENG TEST 15	1.75 to 2.5	12G, 11C, 11D, 12H
	C ₁ 14	C ₁ 15	1.75 to 2.5	11H, 11D, 11C, 11G
Thrust reverser selector valve	C ₁ 23	E36	42 to 52	14A, 14F
Thrust reverser pressure switch	C ₁ 36	C ₁ 34	27 to 33	3A, 4E
Thrust reverser extend proximity sensor	C ₁ 17	C ₁ 39	27 to 33	2A, 1E
Thrust reverser lock removed proximity sensor	C ₁ 20	C ₁ 39	27 to 33	4A, 1E
Thrust reverser P.R.S.O.V.	C ₂ 6	E36	36 to 44	14B, 14F
H.P. valve	C ₂ 3	E36	less than 1	16B, 14F
	E8	Unit case	less than 1	1B, 1F

94786A

R
R

Master junction block test
Table 1 (Sheet 9)

EFFECTIVITY: ALL

050B

1E

71-50-01
Page 513
May 15/89



RB.211 Propulsion System

MAINTENANCE

UNIT	CONNECTOR PIN		RESISTANCE (ohms)	JUNCTION BLOCK TERMINALS CHECKED
	From	To		
Speed switch (SB.71-3351)	DISCONNECT SPEED SWITCH CONNECTOR			
	115V/400Hz 2 Unit	10	less than 1	20F,19F
	ENG TEST 14	Unit 12	less than 1	12G,12C
	ENG TEST 15	Unit 3	less than 1	12H,12D
	ENG TEST 25	Unit 5	less than 1	19E,19A
	ENG TEST 26	Unit 13	less than 1	20E,20A
	G13	Unit 4	less than 1	16D,16H
	Amplifier Plug 3 Pin 7	Unit 7	less than 1	17A,17E
	Amplifier Plug 3 Pin 4	Unit 1	less than 1	18A,18E
	RECONNECT SPEED SWITCH CONNECTOR			

94787

Master junction block test
Table 1 (Sheet 10)

EFFECTIVITY: ALL

71-50-01
Page 514
Nov 15/87

1E



RB.211 Propulsion System

MAINTENANCE

MODULE BLOCK		CONNECTOR PIN		RESISTANCE (ohms)	MODULE TERMINAL CHECKED	UNIT REFERRED TO
Terminal Letters	Terminal Numbers	From	To			
A and E B and F	1 to 4	C, 36	C, 34	30 to 45	3A, 4E	-
		C, 17	C, 39	30 to 45	2A, 1E	-
		C, 20	C, 39	30 to 45	4A, 1E	-
		C, 32	C, 41	less than 1	3B, 4B	-
		C, 32	Unit case	less than 1	4B, 2B	H.P. valve controller
		E8	Unit case	less than 1	1F, 1B	H.P. valve
		E8	Unit case	less than 1	1F, 3F	Fuel H.P. shut-off valve
		E8	Unit case	less than 1	1F, 2F	Fuel flow transmitter
		E8	Unit case	less than 1	1F, 4F	Starter air valve
		E8	Unit case	less than 1	1F, 4F	Starter air valve
C and G	1 to 4	ENG TEST 18	ENG TEST 19	8 to 9	1G, 1H, 2C, 2D	-
		H37	H38	8 to 9	2G, 2C, 2D, 2H	-
D and H	1 to 4	H40	H23	less than 1	4G, 4C, 6E, 6F	-
		H40	Unit 1	less than 1	4C, 3G	F.F.Diff. Press sw.
		E10	Unit 1	less than 1	4H, 3H	F Scav F Diff Press sw
		E10	Unit 1	less than 1	4H, 3D	Oil F Diff Press sw
		E10	Unit 1	less than 1	4H, 3D	Oil F Diff Press sw

94788

Master module block terminal test
Table 2 (Sheet 1)

R
R
R
R
050B

EFFECTIVITY: ALL

1E

71-50-01
Page 515
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

MODULE BLOCK Terminal Terminal Letters Numbers	CONNECTOR PIN From To		RESISTANCE (ohms)	MODULE TERMINAL CHECKED	UNIT REFERRED TO
A and E 5 to 8	H25	E36	less than 1	5E,8A,8B, 9A,9B,12A, 12B,13A, 13B,14F	-
B and F 5 to 8	H40	H23	less than 1	6E,6F,4G,	-
	E27	E36	8 to 12	4C,8F,14F	-
	E25	E36	8 to 12	7E,14F	-
	H23	Unit 3	less than 1	6F,5F	Fuel F Diff Press Sw
	E36	Unit 3	less than 1	8E,14F	Oil F Diff Press Sw
A and E 9 to 12	H25	E36	less than 1	9A,9B,12A,	-
B and F 9 to 12				12B,5E,8A, 8B,13A,13B, 14F	-
	E42	E36	less than 1	10E,14F	-
	E28	E36	8 to 12	9E,14F	-
	E16	E36	23 to 28	9F,14F	-
	G3	G9	44 to 19	11B,16A	-
	E36	Unit 3	less than 1	11E,14F	F Scav F Diff Press Sw
	SB.71-3641				
	E7	Unit 3	less than 1	10A,17F	Speed and temp cont amp
C and G 9 to 12	C ₁ 27	C ₁ 28	1.75 to 2.5	9C,9D,9H, 9G	-
D and H 9 to 12	C ₁ 14	C ₁ 15	1.75 to 2.5	11C,11D, 11G,11H	-
SB. 71-3351	ENG TEST 1	ENG TEST 2	1.75 to 2.5	10C,10D	-
	ENG TEST 14	Unit 12	less than 1	12G,12C	Speed switch
	ENG TEST 15	Unit 3	less than 1	12D,12H	Speed switch 94789A

R
R

Master module block terminal test
Table 2 (Sheet 2)

EFFECTIVITY: ALL

050B

1E

71-50-01
Page 516
May 15/89



RB.211 Propulsion System

MAINTENANCE

MODULE BLOCK		CONNECTOR PIN		RESISTANCE (ohms)	MODULE TERMINAL CHECKED	UNIT REFERRED TO
Terminal Letters	Terminal Numbers	From	To			
A and E B and F	13 to 16	H25	E36	less than 1	8A,9A,9B 12A,i2B, GB,14F, 13A,13B	-
		E26	E36	8 to 10	15E,14F	-
				8 to 12 (SB.73-2864)		
		C ₁ 23	E36	42 to 52	14A,14F	-
		C ₁ 3	E36	less than 1	16B,14F	-
		C ₂ 6	E36	less than 1	14B,14F	-
		G ₂ 3	G9	47 to 60	15B,16A	-
Pre SB. 71-3641 SB. 71-3641		E7	E36	18 to 22	13F,14F	-
		E7	E36	18 to 22	13F,14F, 17F,18F	-
C and G	9 to 12	C ₁ 27	C ₁ 28	1.75 to 2.5	9C,9D,9H, 9G	-
D and H SB. 71-3641	9 to 12	C ₁ 14	C ₁ 15	1.75 to 2.5	11C,11D, 11G,11H	-
		ENG.TEST 1	ENG.TEST 2	1.75 to 2.5	10C,10D	-
		ENG.TEST 14	UNIT 4	less than 1	12C,12G	Speed and temp cont amp
		ENG.TEST 15	UNIT 7	less than 1	12D,12H	
C and G	13 to 16	G13	G29	9 to 11	16D,15D, 20B,19B	-
D and H SB. 71-3351	13 to 16	G5	G15	5000 to 10000	14C,13C, 15C,16C	-
		115V/ 400Hz 1	115V/ 400Hz 2	9 to 11	20B,19F, 15H,15D	-
		ENG TEST 8	ENG TEST 9	5000 to 10000	13G,13C 15G,15C	-
		G13	Unit 4	less than 1	16D,16H	Speed switch 94790A

R
R

Master module block terminal test
Table 2 (Sheet 3)

EFFECTIVITY: ALL

050B

1E

71-50-01
Page 517
May 15/89



RB.211 Propulsion System

MAINTENANCE

MODULE BLOCK Terminal Letters	Terminal Numbers	CONNECTOR From	PIN To	RESISTANCE (ohms)	MODULE TERMINAL CHECKED	UNIT REFERRED TO
A and E	17 to 20	G13	G29	9 to 11	16D, 15D, 20R, 19H	-
B and F	17 to 20	115V/ 400Hz 1	115V/ 400Hz 2	9 to 11	20R, 19F, 15H, 15D 20A, 20E)	-
SB. 71-3351	ENG TEST 26	Unit 13	less than 1		19E, 19A)	Speed Switch
	ENG TEST 25	Unit 5	less than 1		20F, 19B)	
	G29	Unit 10	less than 1		18E, 18A)	
	Amplifier Plug 3	Unit 1	less than 1		17E, 17A)	
	Pin 4					
	Amplifier Plug 3 Pin 7	Unit 7	less than 1			
A and E	17 to 20	ENG TEST 25	Amplifier Plug 2 Pin 8	less than 1	19, 19E	-
B and F	17 to 20	ENG TEST 26	Amplifier Plug 2 Pin 2	less than 1	20A, 20E	-
SB. 71-3641		E7	Amplifier Plug 3 Pin 16	less than 1	17F, 18H	-
C and G	17 to 20	ENG TEST 10	ENG TEST 11	4 to 5	17G, 17C, 17D, 17H	-
D and H	17 to 20	ENG TEST 12	ENG TEST 13	4 to 5	19G, 19C, 19D, 19H	-

94791

Master module block terminal test
Table 2 (Sheet 4)

R
R

R
R

050B

EFFECTIVITY: ALL

1E

71-50-01

Page 518
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

R 3. Translating Cowl Stowed Indication Junction Block - Adjustment/Test (Engines incorporating S.B.78-3753)

R CAUTION: ENSURE ELECTRICAL CONNECTORS ARE FREE FROM LIQUID AND/OR
R SOLID CONTAMINATION BEFORE CONNECTING OR DISCONNECTING.

Service Bulletins referred to:

72-4073 Improved module, in locked and stowed translating
cowl indication system

Referenced Procedures:

- 6-40-00 Exterior Access Doors and Panels - Description and
Operation
- 71-11-00 Cowling, Engines No.1 and 3 - Servicing
- 71-12-05 L.H. and R.H. Upper Hinged Cows - Servicing

A. Test Translating Cowl Stowed Indication Junction Block Module Connections.

Engines without S.B.72-4073 module blocks are marked with
black. Engines with S.B.72-4073 module blocks are marked
with red.

(1) Equipment required:

Avometer or similar test equipment (maximum voltage
not greater than 15 volts)

(2) Disconnect ground power and tag external power receptacle.

(3) Ensure GND SERVICE switch, EXT POWER switch and BATTERY switch, zone 215, are in OFF position and tagged.

(4) Remove aft nose fairing 451BT or 461BT (Ref. 6-40-00).

(5) Open left-hand hinged cowl 413A or 423A for engines No.1 and 3 (Ref. 71-11-00) or 433DL for engine No.2 (Ref. 71-12-05).



RB.211 Propulsion System

MAINTENANCE

- (6) Disconnect the following electrical connectors at the engine/airframe interface.

Connector E (9811-P703)
Connector C1 (9811-P707)

- (7) Disconnect the following unit electrical connectors:

Starter air valve solenoid connector
Lock removed sensor intermediate disconnect connector
Translating cowl stowed proximity sensor intermediate connector

NOTE: When testing module connections F and K fit positive lead of Avometer to pin 22 of plug C.1.

- (8) Using Avometer effect tests detailed in Table 3.

- R (9) Fit aft nose fairing 451BT or 461BT (Ref.6-40-00).

- (10) Close left-hand hinged cowl 413A or 423A for engines No.1 and 3 (Ref. 71-11-00) or 433DL for engine No.2 (Ref. 71-12-05).

- (11) Remove tags fitted in operation A.(2) and (3).

R EFFECTIVITY: ALL

050B

1E

71-50-01
Page 520
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

UNIT	CONNECTOR FROM	PIN TO	RESISTANCE (OHMS)	JUNCTION BLOCK TERMINALS CHECKED
Translating cowl stowed indication junction block module	Plug C1	Stowed Sensor	1000 to 1200	F, C
	9811-P707	9831-P705		
	Pin 22	Pin 2		
	Stowed sensor	Start Valve	less than 1	B, B
	9831-P705	8011-P707		
	Pin 1	Pin 5		
	Plug E	Stowed Sensor	less than 1	A, B
	9811-P703	9831-P705		
	Pin 5	Pin 1		
	Plug C,1	Lock Sensor	less than 1	F, E
	9811-P707	7831-J701		
		Pin 2		

Translating cowl stowed indication junction block module test
Table 3

EFFECTIVITY: ALL

050B

1E

71-50-01
Page 521/522
May 15/89



RB.211 Propulsion System

MAINTENANCE

ENGINE DRAINS - DESCRIPTION AND OPERATION

1. General

The engine drains system collects and disposes of unburnt fuel in the engine resulting from engine shut-down or failure to start, any leakage past the seals of accessory units mounted on the L.P. compressor case and any fluids that collect in the cowls or fairings.

The drains system comprises a series of tubes and drillings which are connected either to drain collectors that are automatically emptied, or to overboard outlets.

Fig.1 (Sheets 1 and 2) illustrates the system diagrammatically and fig.2 (Sheets 1 and 2) shows the units and tubes on the engine.

Service Bulletins referred to:

- S.B.71-2831 - Introduction of Tell Tale Drains System
- S.B.73-2232 - Introduction of Self-consuming Drains System
- S.B.71-2693 - Deletion of Fuel Drains Tank to Pod Disconnect Vent Tube.
- S.B.71-2565 - H.S. Gearbox Gravity Oil Filler - Scupper Drain Tube.
- S.B.71-3236 - Deletion of Flame Traps from Housing Assembly
- S.B.78-2969 - Deletion of Hot Stream Spoiler System and Introduction of 11 Degree Exhaust Collector.
- S.B.71-3656 - Drain to Overboard Dump with Valve Removed.

2. Description

The drains system (Ref. fig.1) located in zones 412, 422 and 432, is divided into the L.P. compressor case drains, the gas generator drains, pylon/nose cowl drains and ancillary drains. These comprise rigid tubes with bolted end connectors and nut and nipple connectors, flexible tubes with nut and nipple connectors, and also internal drillings.

EFFECTIVITY: ALL

050B

16

71-70-00
Page 1
May 15/77



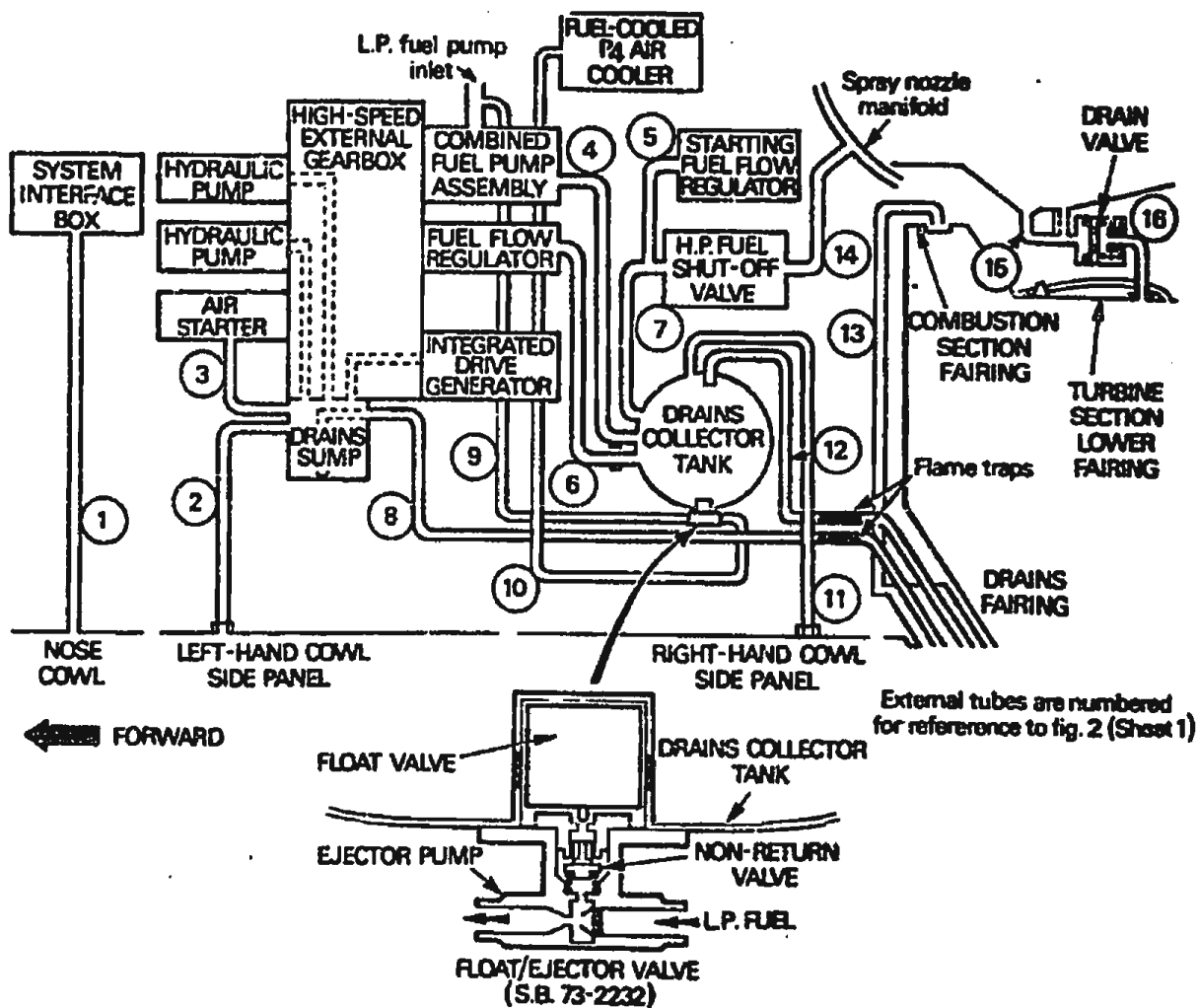
RB.211 Propulsion System

MAINTENANCE

PYLON/NOSE
COWL DRAIN

L.P. COMPRESSOR
CASE DRAINS

GAS GENERATOR
DRAINS



22687C

Drains system diagram - S.B.73-2232
Fig.1 (Sheet 1)

EFFECTIVITY: ALL

050B

16

71-70-00

Page 2
May 15/77



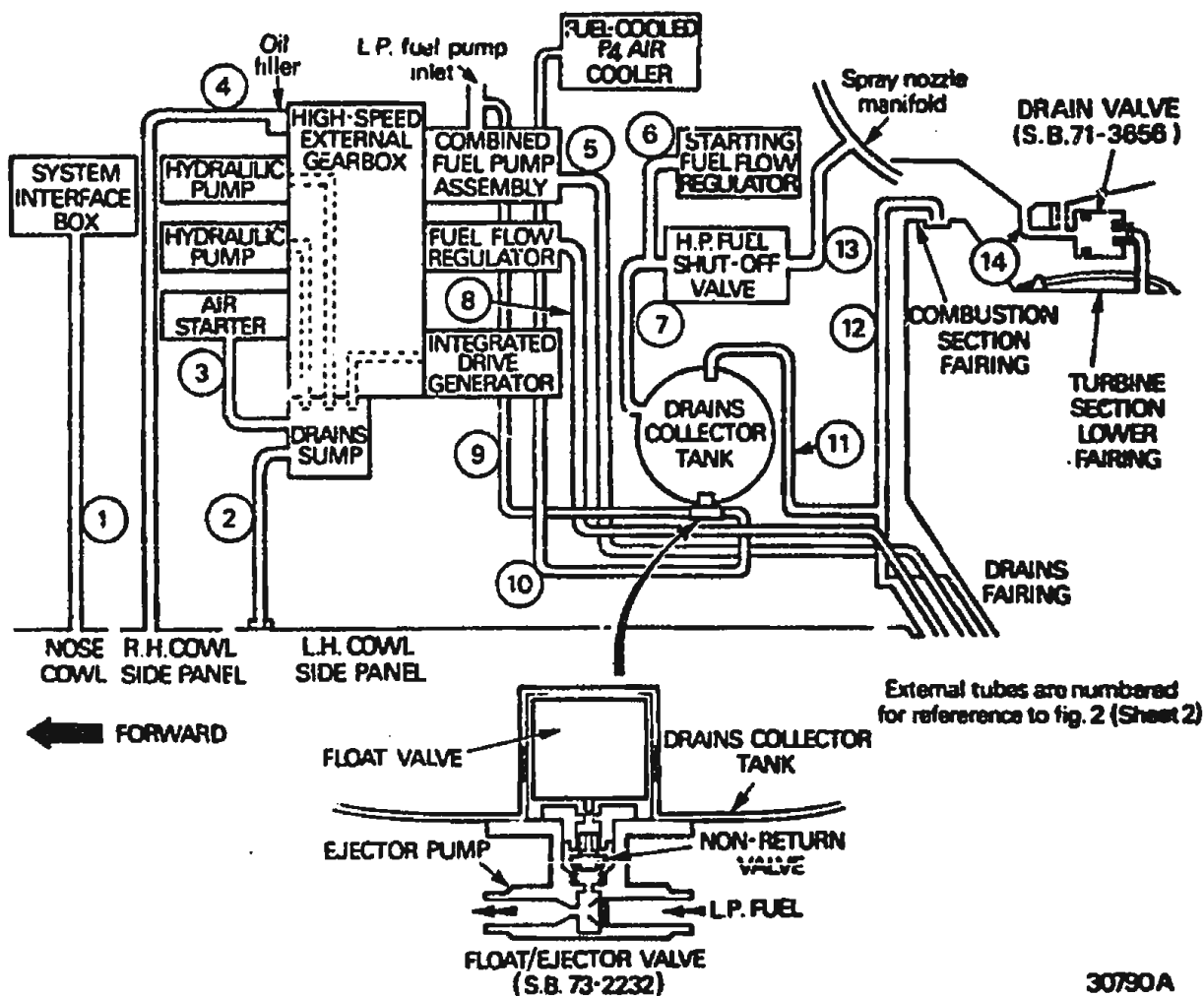
RB.211 Propulsion System

MAINTENANCE

PYLON/NOSE
COWL DRAIN

L.P. COMPRESSOR
CASE DRAINS

GAS GENERATOR
DRAINS



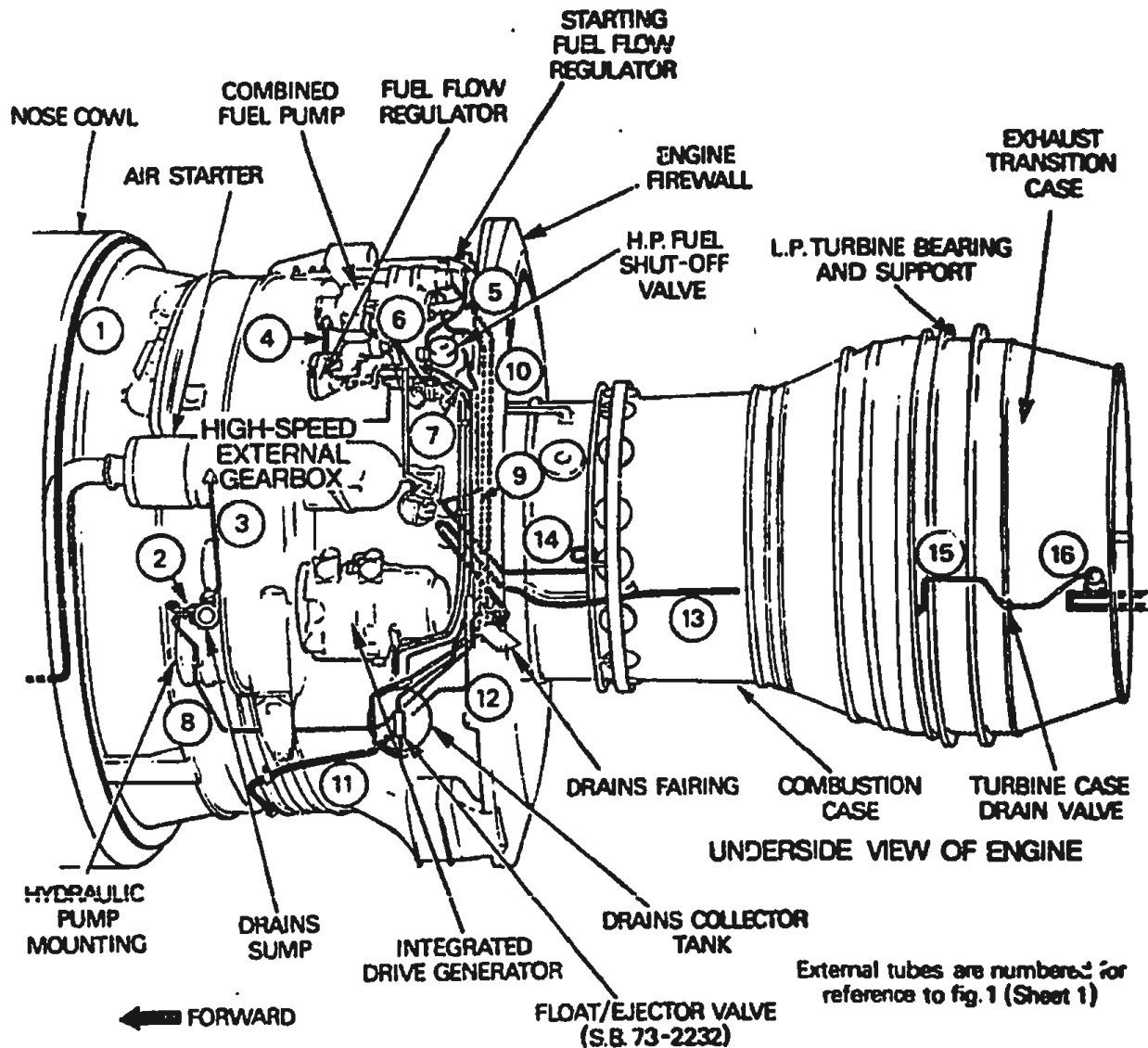
Drains system diagram -
S.B.73-2232 and S.B.71-2831
Fig 1 (Sheet 2)

EFFECTIVITY: ALL



RB.211 Propulsion System

MAINTENANCE



22688C

Drains system external units and tubes - S.B.73-2232
Fig.2 (Sheet 1)

EFFECTIVITY: ALL

050B

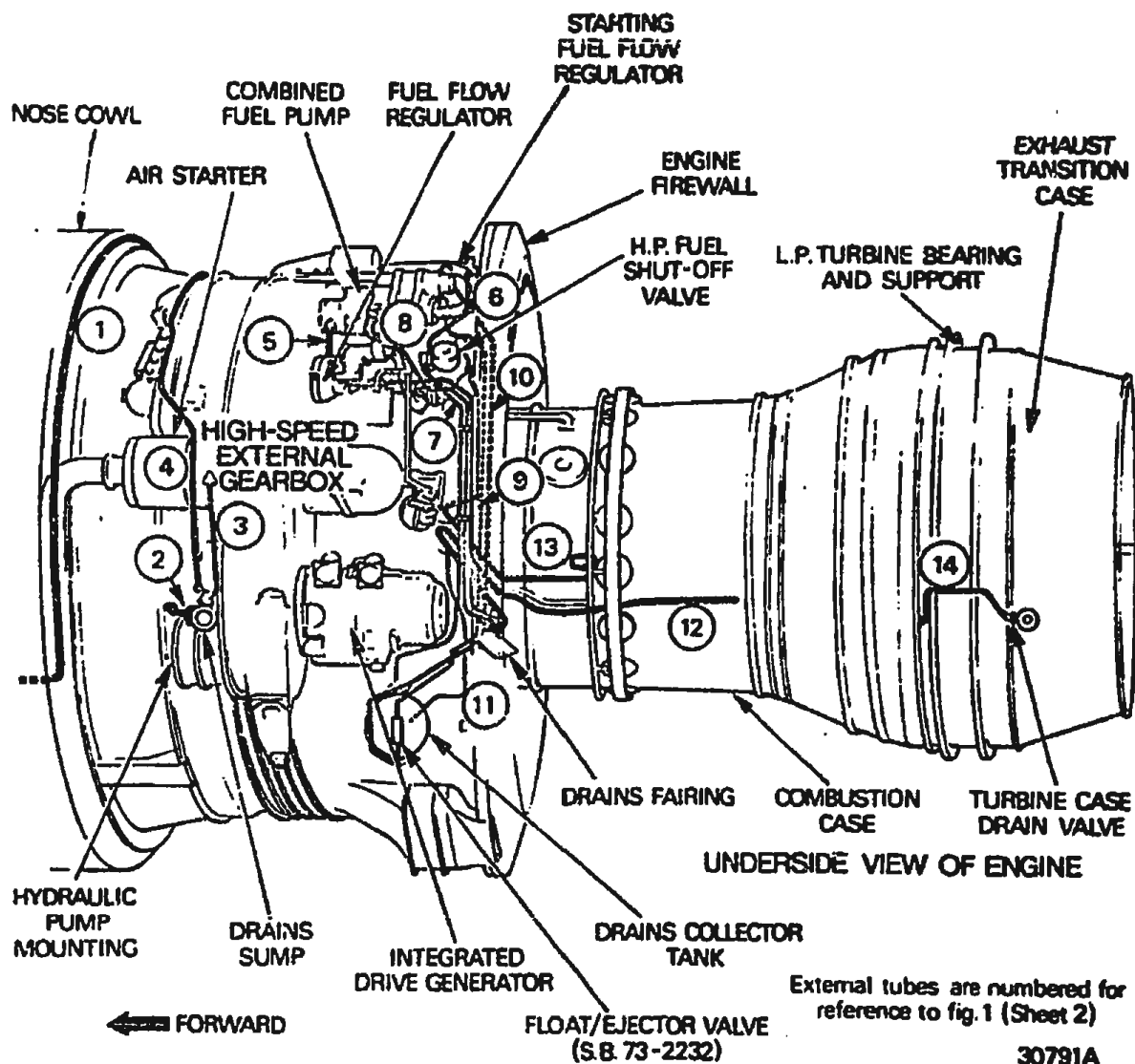
1G

71-70-00
Page 4
May 15/77



RB.211 Propulsion System

MAINTENANCE



Drains system external units and tubes -
S.B.73-2232 and S.B.71-2831
Fig.2 (Sheet 2)

EFFECTIVITY: ALL

050B

16

71-70-00
Page 5
May 15/77



RB.211 Propulsion System

MAINTENANCE

The drain tubes mounted on the L.P. compressor case are sub-divided into fuel and non-fuel drains. The fuel drains comprise tubes from the fuel spray nozzle manifold and H.P. shut-off valve, the combined fuel pump assembly, the fuel flow regulator and the starting fuel flow regulator. All these tubes lead to a drains collector tank. On engines incorporating S.B.71-2831, the drain tubes from the fuel flow regulator and fuel pump assembly are taken directly to the drains fairing (see 2.C.). The tank contents are automatically emptied overboard by the airflow over the drains fairing creating a depression in the tank extraction tube when the aircraft speed exceeds 200 knots.

On engines incorporating S.B.73-2232, L.P. fuel is taken from downstream of the fuel-cooled P4 air cooler and continuously passed through a combination float/ejector valve (see 2.E.) fitted in the base of the drains collector tank. This action extracts any drains fuel that has collected in the tank and the combined flow is then returned to the inlet of the L.P. fuel pump.

The non-fuel drains comprise an external tube from the air starter, an internal tube from the integrated drive generator and internal drillings from the hydraulic pump(s), leading to a drains sump situated at the base of the high-speed external gearbox. The sump contents are automatically emptied overboard by the airflow over the drains fairing creating a depression in the sump extraction tube when the aircraft speed exceeds 200 knots. On engines incorporating S.B.71-2831, improved identification of accessory seal leakage is achieved by adding spouts to the drain outlets in the sump. In addition, the extraction tube is deleted and the sump contents emptied overboard through the vent tube at any aircraft speed.

The drain tubes on the gas generator dispose of fuel remaining in the turbine and exhaust cases and also any fuel and oil leaks from external tubes mounted on the compressor cases.

The pylon/nose cowl and ancillary drains dispose of fluids collecting in the pylon, cowls and gas generator fairings.

EFFECTIVITY: ALL

050B

16

71-70-00

Page 6
May 15/77



RB.211 Propulsion System

MAINTENANCE

A. Drains Collector Tank

The tank (Ref. fig.1 and 2) is mounted on the lower right-hand side of the L.P. compressor case in zones 412, 422 and 432. It is of spherical shape and accommodates a drain plug, three drain tube inlet connectors, and vent and extraction tube connectors. An internal tube, extending to the base of the tank, mates with the extraction tube which is routed rearwards and terminates in a drains fairing (see 2.C.). The extraction tube also acts as an overflow outlet should the tank capacity be exceeded. The tank has the capacity to contain the fuel from eight discharges from the spray nozzle manifold, the displaced air being passed to atmosphere through the vent tube. Two removable plugs fitted in the inlet connector boss facilitate leakage identification in the event of a seal failure in the fuel flow regulator or combined fuel pump assembly.

On engines incorporating S.B.73-2232 a combination/float valve is fitted in the base of the tank (see 2.E.) and the tank internal tube is shortened.

On engines incorporating S.B.71-2831 and S.B.71-2693, the fuel flow regulator and combined fuel pump assembly drain tubes are re-routed (see 2.B.), the vent tube is deleted and blanking plates are fitted to the redundant tank facings.



RB.211 Propulsion System

MAINTENANCE

B. Engine Mounted Tubes

L.P. Compressor Case Drains - Fuel

Rigid tubes (Ref. fig.1 and 2), located in zones 412, 422 and 432, convey to the drains collector tank, the residual fuel from the spray nozzle manifolds upon closure of the H.P. shut-off valve, and any leakage past the seals in the combined fuel pump assembly, the fuel flow regulator and the starting fuel flow regulator. The tube from the latter unit connects to the drain outlet from the H.P. shut-off valve. On engines incorporating S.B.71-2831, the tubes from the combined fuel pump assembly and the fuel flow regulator are re-routed and terminate in bolted end connectors at the lower front face of the engine firewall. These connectors mate with tubes that end in a drains fairing (see 2.C.). Identification of leakage in the event of a fuel flow regulator or combined fuel pump assembly seal failure, is achieved by checking at the tube outlets in the drains fairing. On engines incorporating S.B.73-2232, rigid tubes convey the L.P. fuel to and from the float/ejector valve.

A rigid extraction tube routed rearwards from the collector tank, terminates in a bolted end connector at the lower front face of the engine firewall. This connector mates with a tube that ends in a drains fairing (see 2.C.). On engines incorporating S.B.71-2831, the extraction tube is re-routed and fed into the zone 2 drain tube adjacent to the lower front face of the engine firewall. In this configuration the tube acts as an overflow/vent tube.

A rigid vent tube connects the tank to atmosphere. The outer or flanged end of the tube mates with a sliding seal on the right-hand hinged cowl (Ref. 71-11-00) on wing mounted engines. On the centre engine the flanged end is secured by a Vee band coupling clamp to an extension tube that terminates in an overboard outlet in the right-hand mid fixed cowl (Ref. 71-12-00). On engines incorporating S.B.71-2693, the vent tube is deleted.



RB.211 Propulsion System

MAINTENANCE

L.P. Compressor Case Drains - Non-fuel

The air starter external tube, the integrated drive generator internal tube and the hydraulic pump(s) internal drillings all feed into a drains sump that is integral with and situated on the front face of the high-speed external gearbox (Ref. fig.1 and 2). The sump collects any leakage of oil or hydraulic fluid in the event of a seal failure on the above units and also passes the air exhausting from their drive-shaft seals (Ref. 72-02-00) to atmosphere.

A rigid extraction tube is routed rearwards from the sump and ends in a bolted end connector at the lower front face of the engine firewall. This connector mates with a tube that terminates in a drains fairing (see 2.C.).

A rigid vent tube connects the sump to atmosphere. The outer or flanged end of the tube mates with a sliding seal at the base of the left-hand hinged cowl (Ref. 71-11-00) on wing mounted engines. On the centre engine the flanged end is secured by a Vee band coupling clamp to an extension tube that terminates in an overboard outlet at the lower front face of the engine firewall.

On engine incorporating S.B.71-2831, three spouts are fitted in the outlets from the internal drillings, one in each hydraulic pump drilling and one in the I.D.G. drilling. These spouts protrude into a reduced capacity drains sump so improving identification of a particular accessory seal leak. The internal and external sections of the extraction tube are deleted and a blanking plate fitted to the tank facing. Any excessive seal leakage will drain overboard through the vent tube.

On engines incorporating S.B.71-2565, a rigid drain tube extends from the oil filler, down the lower left-hand side of the external gearbox and terminates adjacent to the drains sump.



RB.211 Propulsion System

MAINTENANCE

Gas Generator Drains

The unburnt fuel remaining in the combustion and turbine sections after engine shut-down or failure to start, drains down to the lowest point of the L.P. turbine case and into an external rigid tube leading to a drain valve assembly (Ref. fig.1 and 2) fitted on the underside of the L.P. turbine bearing and support. From the valve the fuel passes through a rigid/flexible tube assembly terminating at an overboard outlet in the turbine section lower fairing. On engines incorporating S.B.78-2969, the fuel passes from the drain valve through a tube integral with the turbine section lower fairing (Ref. 72-03-00), terminating at an overboard outlet.

When the engine is stationary the valve is spring loaded in the open position and is closed by the action of engine internal gas pressure when the engine is running. On engines incorporating S.B.71-3656, the valve internal components are deleted.

Any fuel or water that collects in the acoustic lining of the exhaust transition case, drains down to the case front flange and then enters the drain valve assembly through an internal drilling.

In the event of leakage from the spray nozzle manifold or oil tubes on the gas generator compressor cases, the fluid will collect in a sump formed in the bottom of the combustion section right-hand lower fairing. To dispose of this fluid a drain tube, with its open end positioned in the sump, is routed forwards and across the cold stream duct and ends in a bolted end connector on the lower front face of the engine firewall. This connector mates with a tube that terminates in a drains fairing (see 2.C.). Any fluid in the sump is extracted through the drain tube to atmosphere due to the pressure differential between L.P. compressor delivery air in zone 2 (Ref. 75-21-00) and pressure at the drains fairing outlet.



RB.211 Propulsion System

MAINTENANCE

C. Power Plant Mounted Tubes

The extraction tubes from the drains collector tank, the drains sump and the drain tube from combustion fairing sump, connect at the lower face of the engine firewall, with three short rigid tubes that are routed to atmosphere through an aerodynamically shaped drains fairing (zones 412, 422 and 432) secured to the rear face of the engine firewall (Ref. fig.1 and 2).

The tubes from the drains collector tank and the drains sump incorporate a flame trap at their entry to the drains fairing. On engines incorporating S.B.71-2831, drain tubes from the fuel flow regulator, combined fuel pump assembly and combustion fairing sump connect with the drains fairing tubes. On engines incorporating S.B.71-3236, the flame traps are deleted.

D. Pylon/Nose Cowl Drain Tubes (Engines No.1 and No.3)

Any fluids that collect in the system interface box (Ref. 54-11-00) in the wing pylon structure (zones 452 and 462), drain through two flexible tubes to a T-union positioned at the top of the nose cowl rear diaphragm (zones 411 and 421). From the union a rigid tube is routed down the left-hand side of the rear diaphragm to an overboard outlet at the lower rear of the nose cowl.

E. Combination Float/Ejector Valve

On engines incorporating S.B.73-2232, a combination float/ejector valve (Ref. fig.1) comprising a float valve and ejector pump is fitted in the base of the drains collector tank. A non-return valve, spring loaded in the closed position, is interposed between the ejector pump and float valve to prevent fuel entering the collector tank when the engine is stationary.



RB.211 Propulsion System

MAINTENANCE

Drains fuel in the tank causes the float valve to lift off its seating and during engine operation the flow of L.P. fuel through the ejector pump creates a depression at the pump orifice, opens the non-return valve and extracts the fuel from the tank. When the drains fuel in the tank has fallen to a pre-determined level, the float valve returns to its seating to prevent air being drawn into the L.P. fuel system.

F. Ancillary Drains - Cowls and Fairings

In the event of any leakage from external oil tubes on the L.P. turbine bearing and support, the oil will collect in a trough at the forward end of the turbine section lower fairing (Ref. 72-03-00). To dispose of this oil a drain tube (Ref. fig.1), with its open end positioned in the trough, is routed rearwards to an overboard outlet at the rear of the fairing. Any oil is extracted through the drain tube to atmosphere due to the pressure differential between the tube inlet and outlet.

To prevent the accumulation of fluids in the nose cowl and gas generator turbine section lower fairing, drainage holes are provided along their bottom centre line.

EFFECTIVITY: ALL

050B

16

71-70-00
Page 12
May 15/77



RB.211 Propulsion System

MAINTENANCE

ENGINE DRAINS - FAULT ISOLATION

1. General

The diagrams and schematics in this section can be used for fault isolation any time a fault is reported or suspected. Uncommon abbreviations are defined on the using fault code diagram or schematic.

- R If the flight crew reports a fault using a fault code number, the code number can be found in the Fault Isolation Reference Table in the Chapter 71 Fault Code Index. The index specifies the exact maintenance manual section, fault isolation diagram, and block number on the diagram where the fault isolation procedure should start. Where applicable, schematics are included at the end of the section to supplement the fault code diagrams or as an aid in isolating a problem not covered on the diagrams.

Refer to the Maintenance Manual Introduction for a more detailed discussion of the Fault Isolation Reporting Method (FIRM) and use of fault isolation diagrams/schematics.

2. Fault Isolation/Identification

Table 101 lists the fault isolation diagrams and schematics in this section.

TABLE 101

FIGURE	TITLE
Fig.101	Fuel leakage from drains fairing (Pre S.B.71-2831)
Fig.101A	Fuel leakage from drains fairing (S.B.71-2831)
Fig.102	Restricted/no fuel flow from turbine case drain following an aborted wet start.

EFFECTIVITY: ALL

050B

1A

71-70-00
Page 101
Nov 15/85

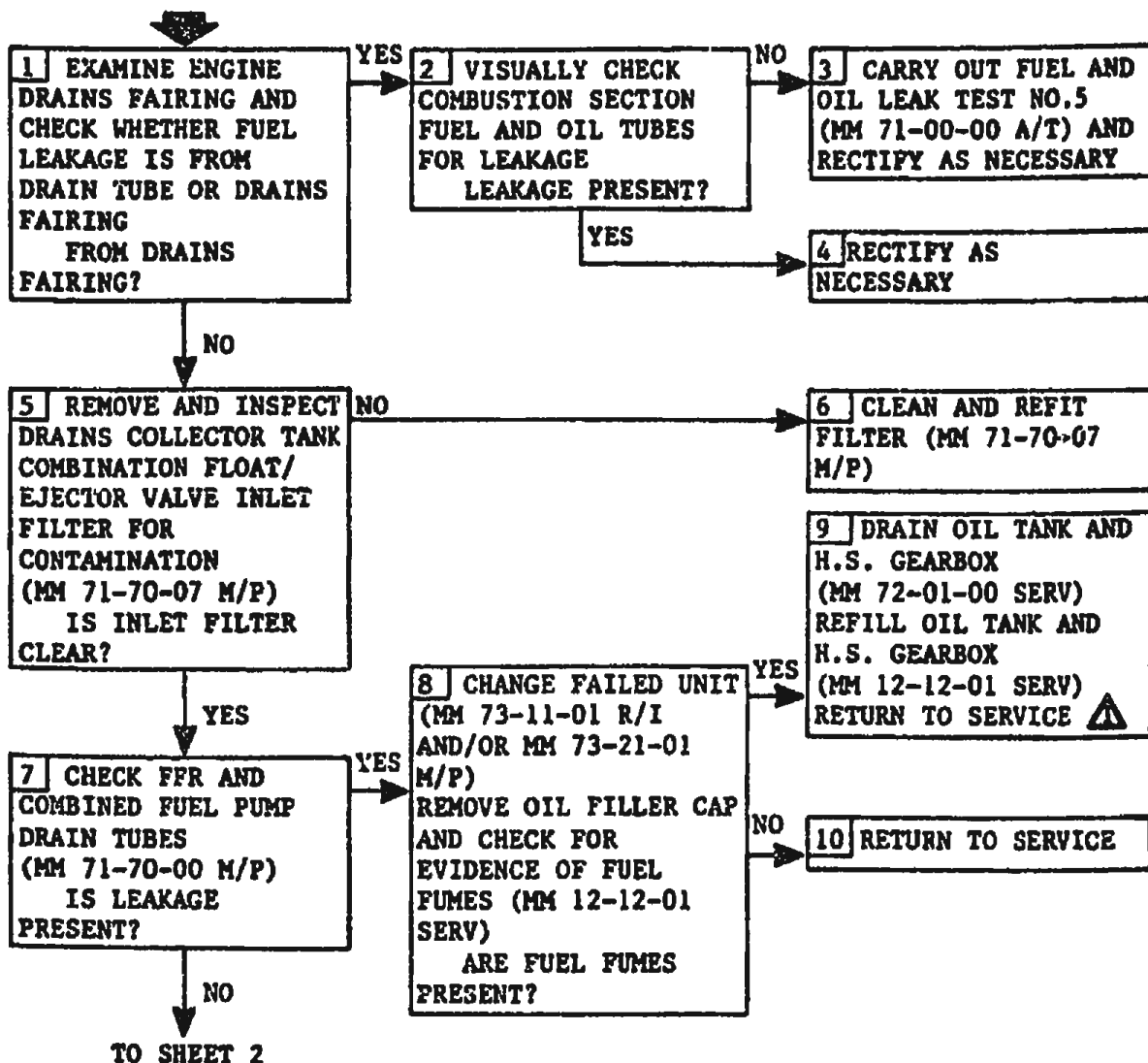


RB.211 Propulsion System

MAINTENANCE

FUEL LEAKAGE FROM DRAINS
FAIRING (PRE S.B.71-2831)

PREREQUISITES: NONE



⚠ CHECK AND RECORD MAGNETIC CHIP DETECTORS BEFORE AND AFTER NEXT FLIGHT

A2032

CR
CR

Fuel leakage from drains fairing (Pre S.B.71-2831)
Fig.101 (Sheet 1 of 2)

EFFECTIVITY: ALL

0508

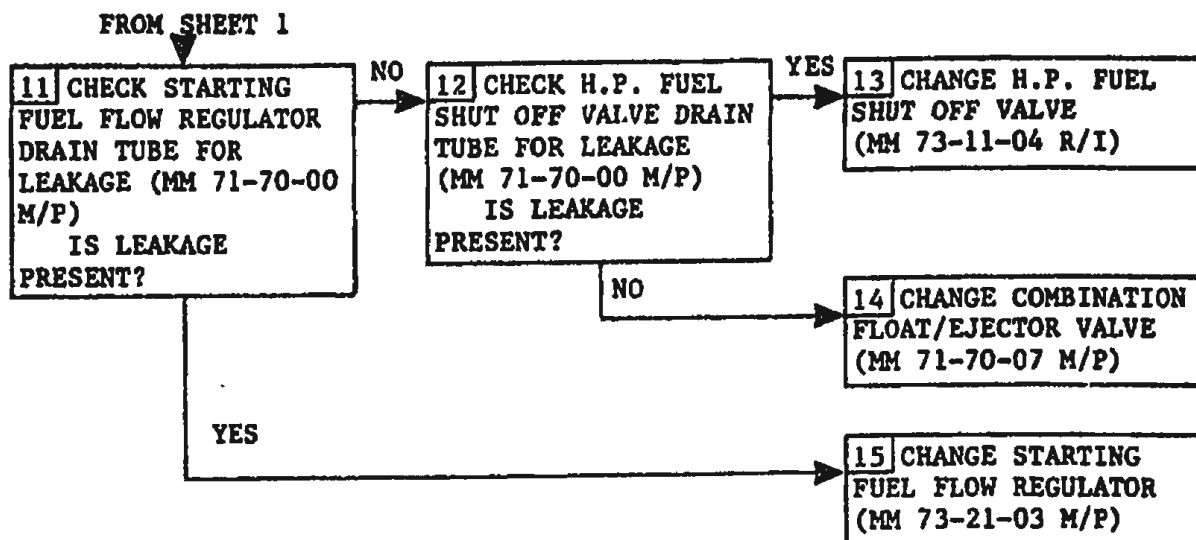
1A

71-70-00
Page 102
Dec 15/93



RB.211 Propulsion System

MAINTENANCE



366438

R
R

Fuel leakage from drains fairing (Pre S.B.71-2831)
Fig.101 (Sheet 2 of 2)

EFFECTIVITY: ALL

050B

1A

71-70-00
Page 103
Dec 15/93

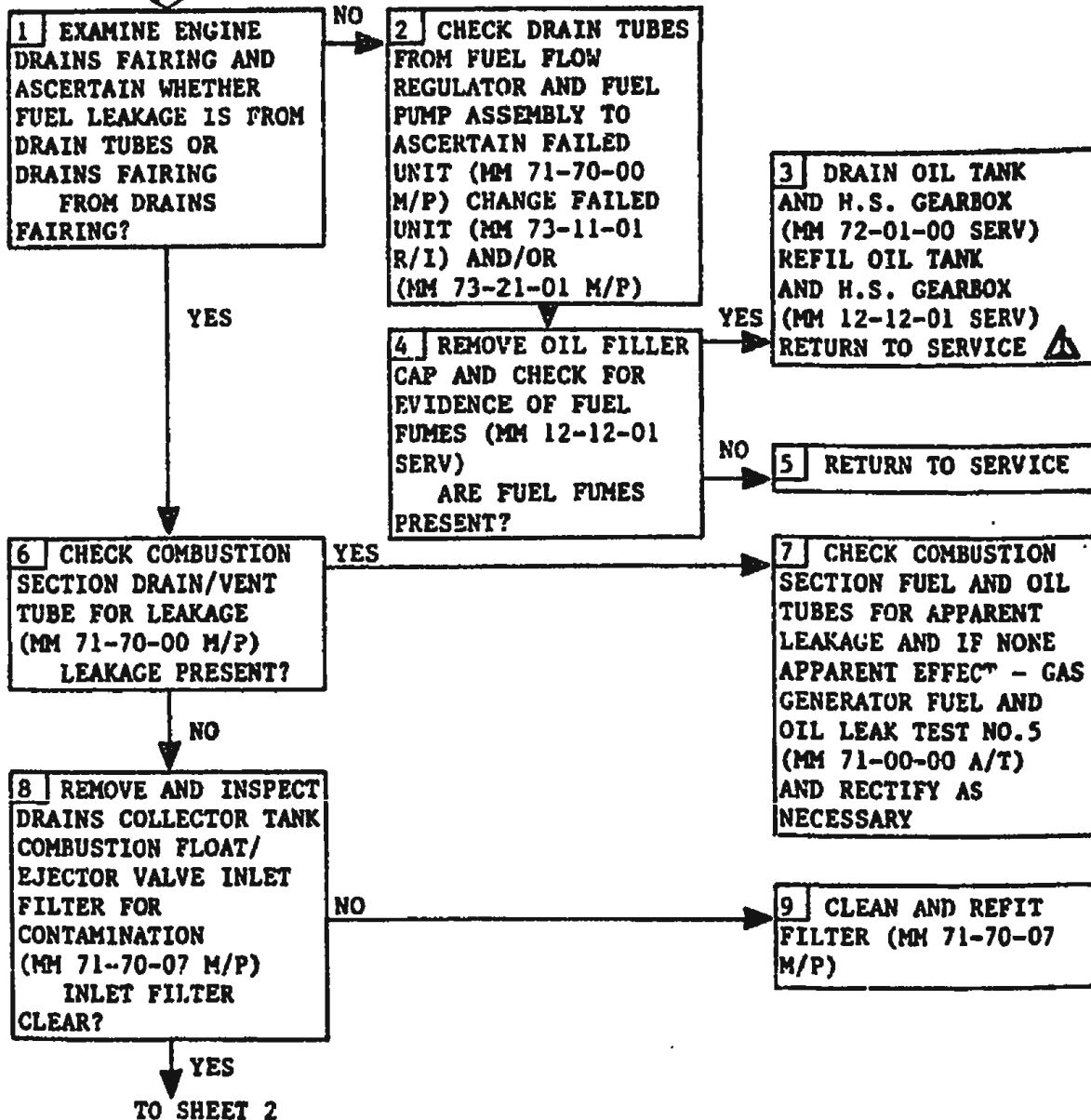


RB.211 Propulsion System

MAINTENANCE

FUEL LEAKAGE FROM DRAINS FAIRINGS

PREREQUISITES: NONE



⚠ CHECK AND RECORD MAGNETIC CHIP DETECTORS BEFORE AND AFTER NEXT FLIGHT
A2033

CR
CR

Fuel leakage from drains fairing (S.B.71-2831)
Fig.101A (Sheet 1 of 2)

EFFECTIVITY: ALL

050B

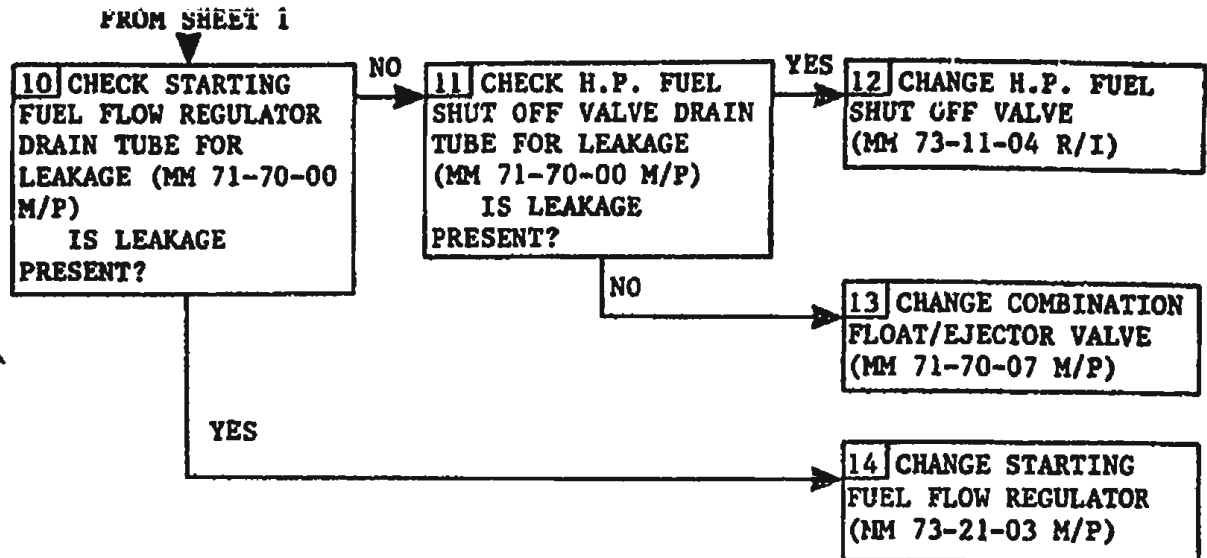
1A

71-70-00
Page 104
Dec 15/93



RB.211 Propulsion System

MAINTENANCE



36645B

R
R

Fuel leakage from drains fairing (S.B.71-2831)
Fig.101A (Sheet 2 of 2)

EFFECTIVITY: ALL

050B

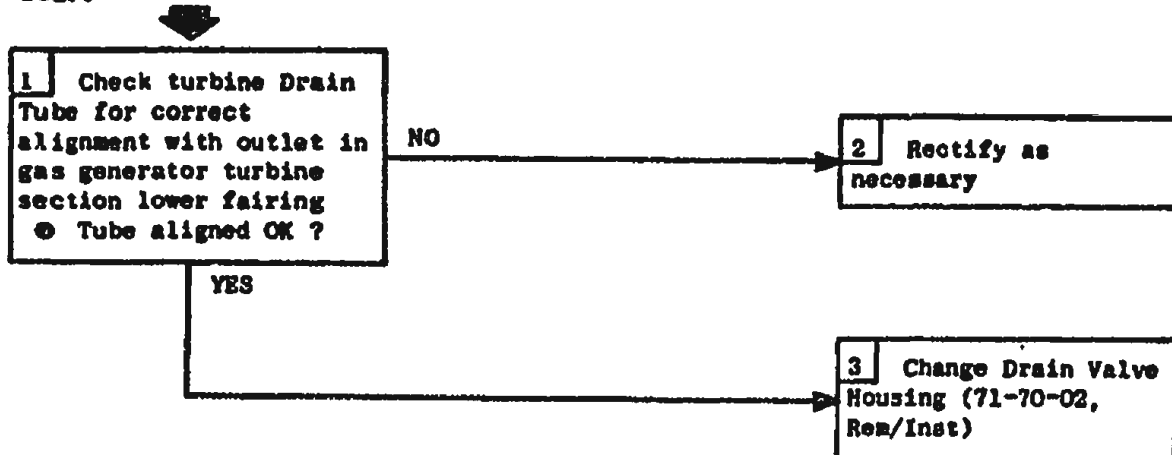
1A

71-70-00
Page 105
Dec 15/93



RB.211 Propulsion System MAINTENANCE

Restricted/No fuel flow
from turbine case drain
following an aborted wet
start



NOTE: On Engines incorporating S.B.71-3656 commence at block 1
On Engines not incorporating S.B.71-3656 effect block 3

S.B.71-3656 - Drain to overboard dump with valve removed.

35864A

Restricted/no fuel flow from turbine case drain
following an aborted wet start
Fig.102

R
R
050B

EFFECTIVITY: ALL

1A

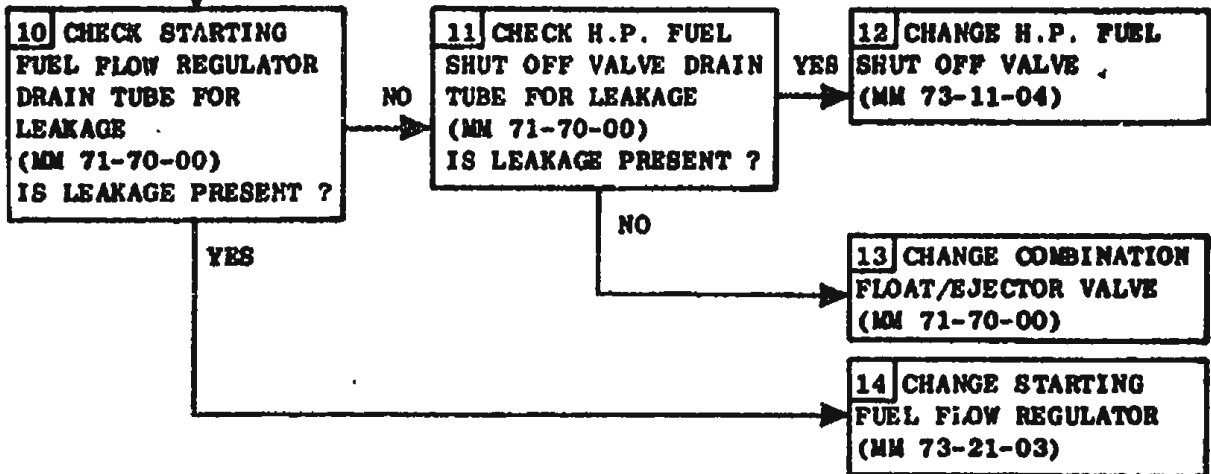
71-70-00
Page 106
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

FROM SHEET 1



36645A

Fuel leakage from drains fairing (S.B.71-2831)
Fig.101A (Sheet 3 of 3)

R EFFECTIVITY: ALL

R
050B

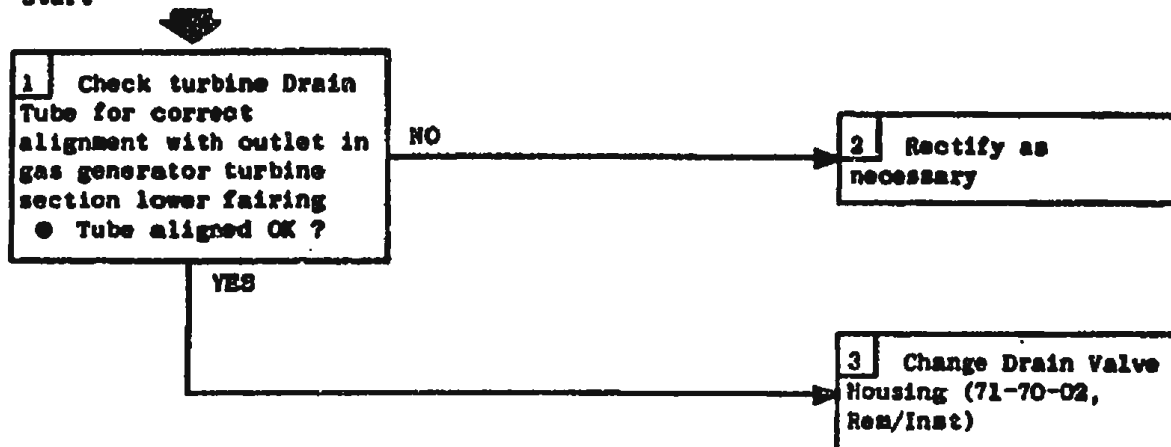
1A

71-70-00
Page 107
Mar 15/91



RB.211 Propulsion System MAINTENANCE

Restricted/No fuel flow
from turbine case drain
following an aborted wet
start



NOTE: On Engines incorporating S.B.71-3656 commence at block 1
On Engines not incorporating S.B.71-3656 effect block 3

S.B.71-3656 - Drain to overboard dump with valve removed.

35864A

Restricted/no fuel flow from turbine case drain
following an aborted wet start
Fig.102

R
R
050B

EFFECTIVITY: ALL

1A

71-70-00
Page 108
Mar 15/91



RB.211 Propulsion System

MAINTENANCE

ENGINE DRAINS - MAINTENANCE PRACTICES

1. Inspection/Check

Service Bulletins referred to:

S.B.71-2831 Introduction of Tell Tale Drains System
S.B.72-3925 Re-introduction of Deep Sump Cover on
Accessory Drains

Referenced Procedures:

70-02-01 Identification, Lubrication and Fitting of Rubber
Sealing Rings.
71-00-00 Power Plant - Adjustment/Test.
71-11-00 Cowling, Engines No.1 and No.3 - Servicing.
71-12-01 L.H. and R.H. Lower Hinged Cowls - Servicing.

Illustrated Parts Catalogue References:

The I.P.C. sections where parts disturbed during the
following operations can be located are as follows:

71-70-01 Drains Collector Tank.
72-63-00 H.S. External Gearbox - Oil Filler, Filter and
Drain.

A. Check Drainage Rates

(1) Equipment required:

Clean, graduated, transparent container - minimum
capacity 10 c.c.

(2) Material required:

	British Spec./Ref.	American Spec./Ref.	OMat Item No.
Lockwire	DTD.189A 22 S.W.G.	- 21 A.W.G.	238

R
R

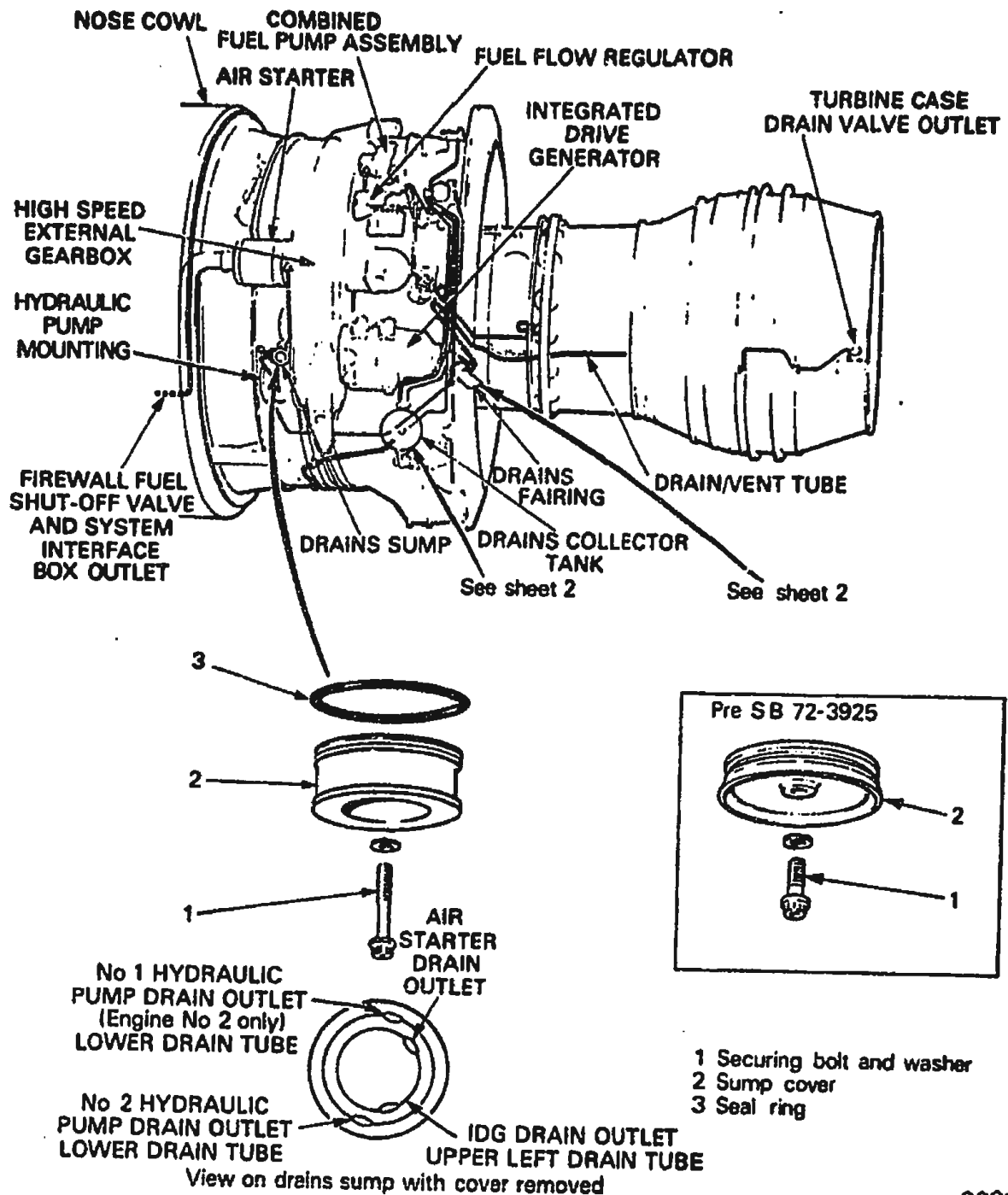
050B

EFFECTIVITY: ALL

1A

71-70-00
Page 201
May 15/88

ROLLS ROYCE RB.211 Propulsion System
MAINTENANCE



98818

CR
CR

Engine drains inspection/check
Fig.201 (Sheet 1)

EFFECTIVITY: ALL

050B

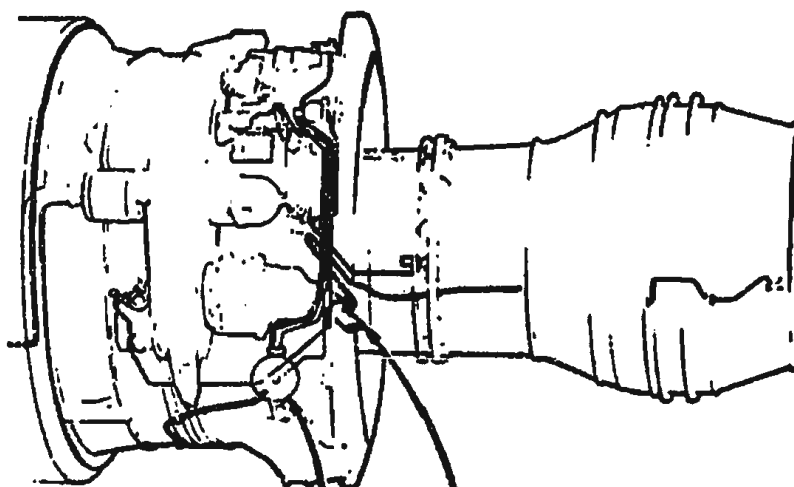
1A

71-70-00
Page 202
May 15/88

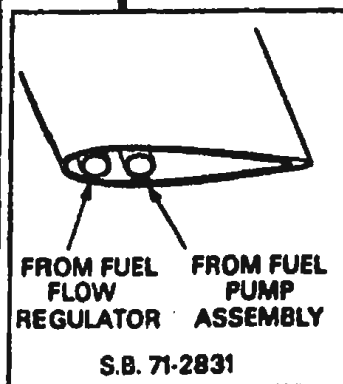
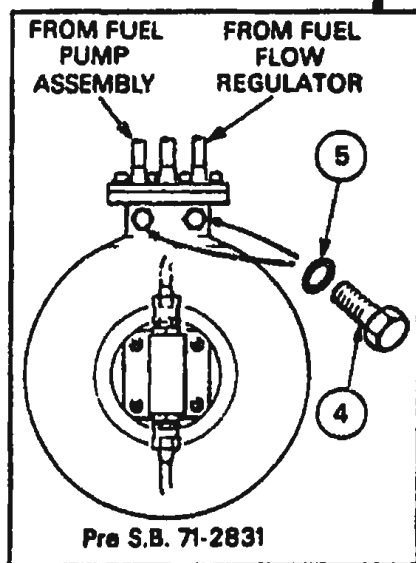


RB.211 Propulsion System

MAINTENANCE



See sheet 1 See sheet 1



4. Sealing plug
5. Sealing ring

40179

R
R

Engine drains inspection/check
Fig.201 (Sheet 2)

EFFECTIVITY: ALL

050B

1A

71-70-00
Page 203
Aug 15/78



RB.211 Propulsion System

MAINTENANCE

- (3) Fuel unit drains, fuel pump assembly and fuel flow regulator - engines not incorporating S.B.71-2831.
- (a) Open R.H. hinged cowl, 414A or 424A for engines No.1 or 3 (Ref. 71-11-00) or 434AR for engine No.2 (Ref. 71-12-01).
 - (b) Refer to fig.201, remove appropriate plug (4) and seal (5) from inlet connector boss on drains collector tank.
 - (c) Check drainage rate.
See 1.B. for acceptance standards.
 - (d) Fit and lubricate (Ref. 70-02-01) new seal ring (5) to plug (4).
 - (e) Fit plug to inlet connector boss and wirelock.
 - (f) Close R.H. hinged cowl, 414A or 424A for engines No.1 or 3 (Ref. 71-11-00) or 434AR for engine No.2 (Ref. 71-12-01).
- (4) Fuel unit drains, fuel pump assembly and fuel flow regulator - engines incorporating S.B.71-2831.
- (a) Check drainage rate at tube outlets in drains fairing (Ref. fig.201).
See 1.B. for acceptance standards.
- (5) Non-fuel unit drains - hydraulic pump(s), air starter and integrated drive generator.
- (a) Open R.H. hinged cowl, 414A or 424A for engines No.1 or 3 (Ref. 71-11-00) or 433AR for engine No.2 (Ref. 71-12-01).
 - (b) Refer to fig.201, release bolt and washer (1) and remove drains sump cover (2).
 - (c) Identify appropriate drain tube outlet, ground run engine (Ref. 71-00) at ground idle and check drainage rate.
See 1.B. for acceptance standards.

R EFFECTIVITY: ALL

050B

1A

71-70-00

Page 204
May 15/88



RB.211 Propulsion System

MAINTENANCE

- (d) Fit and lubricate (Ref. 70-02-01) a new seal ring (3) to sump cover (2).
 - (e) Fit sump cover and secure with bolt and washer (1).
 - (f) Close R.H. hinged cowl, 413A and 423A for engines No.1 or 3 (Ref. 71-11-00) or 433AR for engine No.2 (Ref. 71-12-01).
- (6) Pylon/nose cowl drain - firewall fuel shut-off valve
- (a) See 1.B. for acceptance standards.
- (7) Combustion section drain/vent tube
- (a) If any drainage is apparent from combustion section drain/vent tube at drains fairing, (fig.201), check gas generator fuel and oil tubes for leaks (Ref. 71-00-00, Adjustment/Test, Table 502).
- See 1.B. for acceptance standards.



RB.211 Propulsion System

MAINTENANCE

Air starter	(Oil (starter system)	Weepage only
	(Engine oil	1 drop/3 min.
	(	(1 cc./hr. maximum)
Integrated drive generator	(Oil (I.D.G.) system)	1 drop/1.5 min.
	(	(2 cc./hr. maximum)
	(Engine oil	1 drop/3 min.
Firewall fuel shut-off valve	(	(1 cc./hr. maximum)
	Fuel	Nil
(2)	Combustion section drain/vent tube	(Fuel and/or engine oil
		Nil
(3)	Turbine case drain valve	Fuel
		Discharge with every shut-down

EFFECTIVITY: ALL

0508

1A

71-70-00
Page 207/208
Jun 15/96



RB.211 Propulsion System

MAINTENANCE

ENGINE MOUNTED TUBES - REMOVAL/INSTALLATION

1. Removal/Installation Drain Valve Housing

Service Bulletins referred to:

S.B.78-2969 - Deletion of Hot Stream Spoiler System and
Introduction of 11 Degree Exhaust Collector

Referenced Procedures

70-51-00 Torque Tightening Techniques
72-03-00 Gas Generator Fairings - Removal/Installation

Illustrated Parts Catalogue References

The I.P.C. sections where parts disturbed during the following
operations can be located are as follows:

71-70-02 Fuel Drain Tubes S.B.78-2969
71-70-03 Fuel Drain Tubes Pre S.B.78-2969

A. Remove Drain Valve Housing - Engines incorporating
S.B.78-2969

(1) Equipment required:

CP.20309 or XUT.37594	Working platform
or (XUT.42526	Spacer
(XUT.42527	Side piece

(2) WARNING: ENSURE THRUST REVERSER SYSTEM IS LOCKED
IN FORWARD THRUST POSITION WHILE WORK IS
IN PROGRESS.

Deactivate and tag thrust reverser and associated
systems and fit thrust reverser mechanical locks
(Ref. 78-30-00, Servicing).

(3) Remove turbine section lower fairing (Ref. 72-03-00).

(4) Fit working platform in cold stream duct.

(5) Refer to fig.401, disconnect connector (1).

(6) Remove bolts (2).

EFFECTIVITY: ALL



RB.211 Propulsion System

MAINTENANCE

- (7) Support adapter and bracket (4) and drain valve housing (5) then remove bolts and nuts (3).
- (8) Remove (4) and (5) and retain (4) for refitment.

B. Install Drain Valve Housing - Engines incorporating S.B.78-296

(1) Material required:

	British Spec./Ref.	American Spec./Ref.	OMat Item No.
Lockwire	DTD.189A 22 S.W.G.	- 21 A.W.G.	238

- (2) Ensure thrust reverser is locked and systems are deactivated and tagged as detailed in operation A.(2).
- (3) Refer to fig.401, position drain valve housing (5) on L.P. turbine bearing and support rear flange and adapter and bracket (4) on exhaust transition case front flange, ensuring correct alignment of bolt holes, then fit and secure bolts and nuts (3).
- (4) Fit and secure bolts (2).
- (5) Fit and secure (Ref. 70-51-00) connector (1) and wirelock.
- (6) Remove working platform from cold stream duct.
- (7) Install turbine section lower fairing (Ref. 72-03-00).
- (8) Unlock and reactivate thrust reverser and associated systems (Ref. 78-30-00, Servicing).

C. Remove Drain Valve Housing - Engines not incorporating S.B.78-2969

(1) Equipment required:

CP.20309 or XUT.37594	Working platform
or (XUT.42526	Spacer
(XUT.42527	Side piece

EFFECTIVITY: ALL

050B

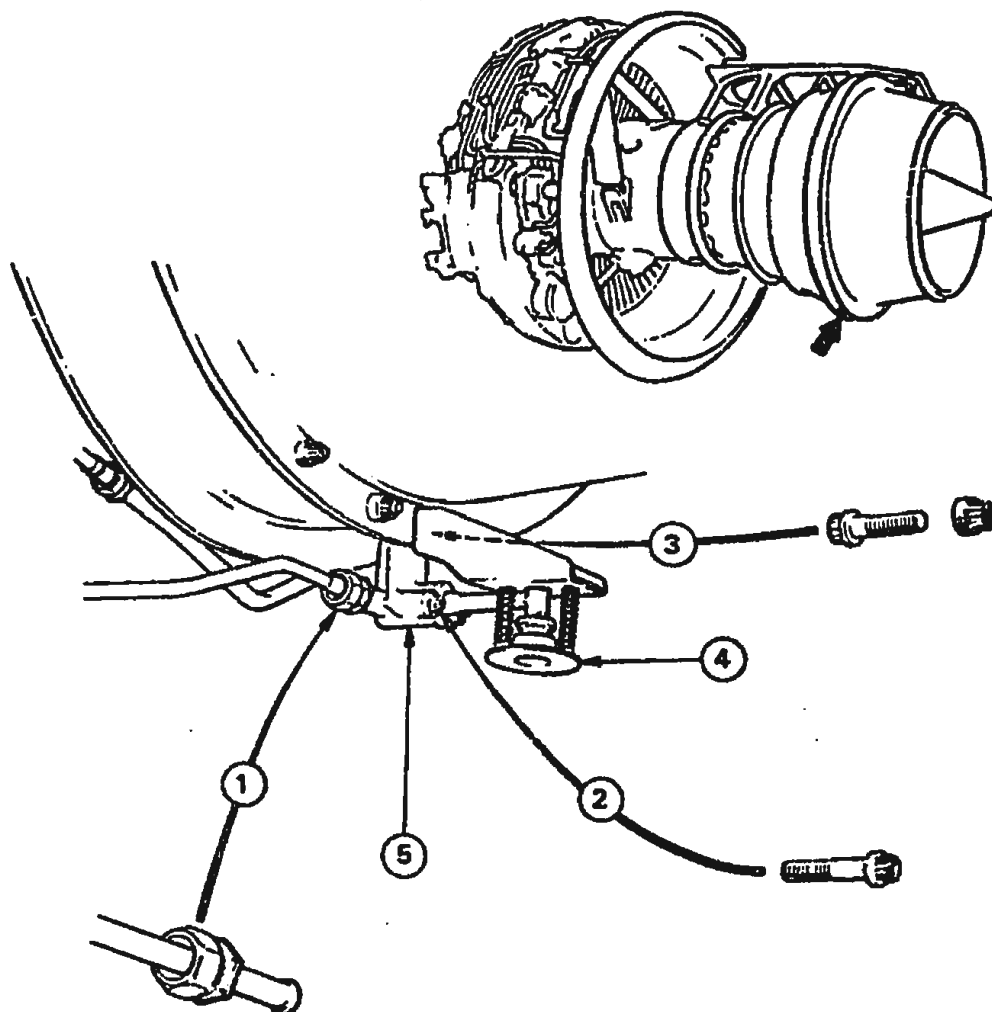
16

71-70-02
Page 402
May 15/77



RB.211 Propulsion System

MAINTENANCE



1. Connector - fuel drain tube
2. Bolt (2 off)-securing overboard drain adaptor
3. Bolt and nut (2 off)-securing drain valve housing
4. Overboard drain adaptor and bracket
5. Drain valve housing

31617

Drain valve housing disconnect points (S.B.78-2969)
Fig.401

EFFECTIVITY: ALL

050B

16

71-70-02
Page 403
May 15/77



RB.211 Propulsion System

MAINTENANCE

- (2) WARNING: ENSURE THRUST REVERSER SYSTEM IS LOCKED IN FORWARD THRUST POSITION WHILE WORK IS IN PROGRESS.

Deactivate and tag thrust reverser and associated systems and fit thrust reverser mechanical locks (Ref. 78-30-00, Servicing).

- (3) Remove turbine section lower fairing (Ref. 72-03-00).
(4) Fit working platform in cold stream duct.
(5) Refer to fig.402, disconnect connector (1).
(6) Remove bolts (2).
(7) Remove bolts and nuts (3) then remove drain valve housing (4).

D. Install Drain Valve Housing - Engines not incorporating S.B.78-2969

- (1) Material required

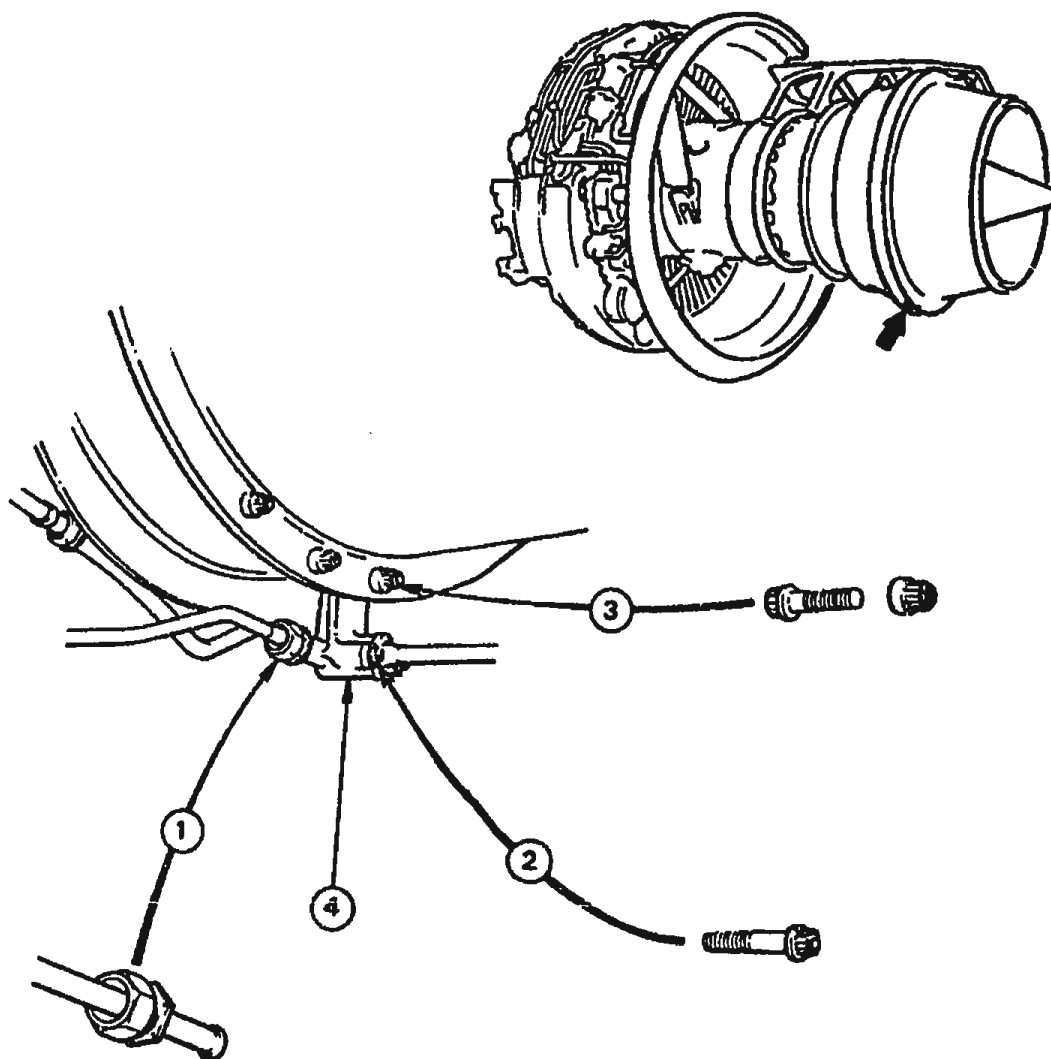
	British Spec./Ref.	American Spec./Ref.	OMat Item No.
Lockwire	DTD.189A 22 S.W.G.	- 21 A.W.G.	238

- (2) Ensure thrust reverser is locked and systems are deactivated and tagged as detailed in operation C.(2).
(3) Refer to fig.402, position drain valve housing (4) on L.P. turbine bearing and support rear flange, ensuring correct alignment of bolt holes, then fit and secure bolts and nuts (3).
(4) Position drain tube then fit and secure bolts (2).
(5) Fit and secure (Ref. 70-51-00) connector (1) and wirelock.
(6) Remove working platform from cold stream duct.



AB.211 Propulsion System

MAINTENANCE



1. Connector - fuel drain tube
2. Bolt (2 off) - securing overboard drain tube
3. Bolt and nut (2 off) - securing drain valve housing
4. Drain valve housing

31618

Drain valve housing disconnect points (Pre S.B.78-2969)
Fig.402

EFFECTIVITY: ALL

0508

1G

71-70-02
Page 405
May 15/77



RB.211 Propulsion System

MAINTENANCE

- (7) Install turbine section lower fairing (Ref. 72-03-00).
- (8) Unlock and reactivate thrust reverser and associated systems (Ref. 78-30-00, Servicing).

EFFECTIVITY: ALL

050B

16

71-70-02
Page 406
May 15/77

LOCKHEED
MAINTENANCE MANUAL

ENGINE NO. 2 TANK OVERBOARD DRAINS VENT LINE TUBES
REMOVAL AND INSTALLATION

1. Equipment and Materials

Protective caps

Environmental seal, LAC Spec C-40-769, Type I, or equivalent

2. Referenced Procedures

20-36-02 Double T-Bolt V-Band Coupling - Removal and Installation

71-12-05 LH and RH Upper Hinged Cowls - Servicing

PB75-425 Environmental Sealing of Model L-1011 Airplane

3. Removal/Installation

A. Removal

- (1) Open RH upper hinged cowl (Ref. 71-12-05).
- (2) Remove double T-bolt V-band coupling (Ref. 20-36-02) that connects engine No. 2 tank overboard drain vents line to engine fuel tank (Ref. Fig. 401).
- (3) Disconnect coupling at inlet duct and remove vent line.
- (4) Place protective caps on ends of fuel drains tank overboard vent line.
- (5) Remove bolts, washers, and nuts attaching inlet duct to support structure.
- (6) Remove screws attaching inlet duct to RH mid fixed cowl panel and remove inlet duct. Install cap on tube end of inlet duct.

B. Installation

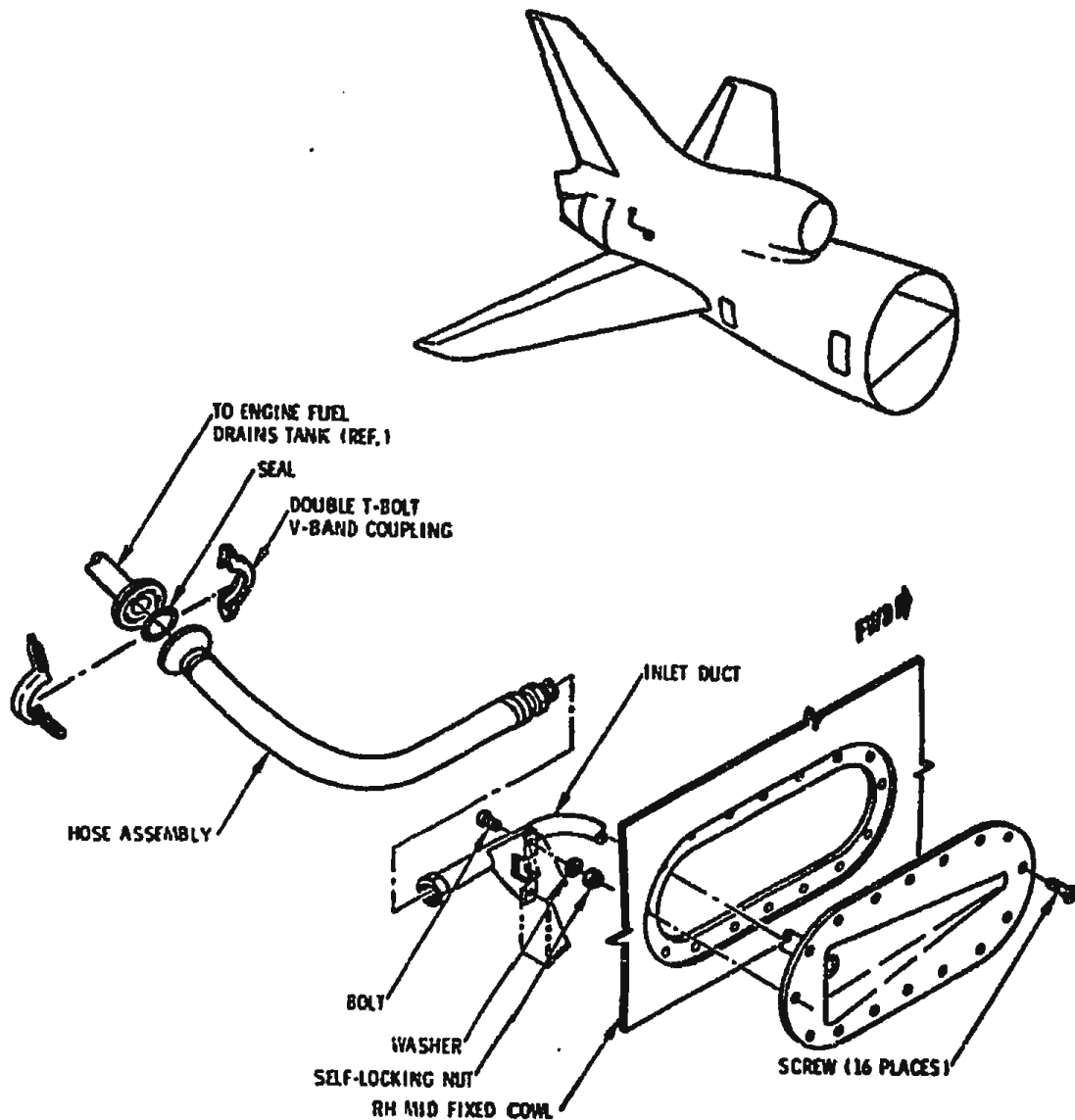
- (1) Remove all sealant from surfaces of inlet duct and mid fixed cowl panel (Ref. PB75-425).
- (2) Apply sealant to the mating surface of inlet duct and mid fixed cowl panel in accordance with PB75-425.

EFFECTIVITY: 001-014 only

619B

71-70-04
Page 401
May 15/77

LOCKHEED
MAINTENANCE MANUAL



MA 8721
M1-0100-71-451

Engine No. 2 Overboard Drains Vent Line Tubes
Removal and Installation
Figure 401

EFFECTIVITY: 001-014 only

619B

71-70-04
Page 402
May 15/77

LOCKHEED
MAINTENANCE MANUAL

Align inlet duct holes with mid fixed cowl panel holes and install attachment screws.

- (3) Secure inlet duct to support structure with attaching bolts, washers, and nuts.
- (4) Remove protective caps from vent line and inlet duct.
- (5) Inspect V-flange seal (E-seal) for condition. Replace if necessary.
- (6) Connect overboard drain vent line to engine No. 2 fuel drains tank with double T-bolt V-band coupling (Ref. 20-36-02).
- (7) Connect vent line to inlet duct.
- (8) Close RH upper hinged cowl (Ref. 71-12-05).

EFFECTIVITY: 001-014 only

619B

71-70-04
Page 403/404
May 15/77

LOCKHEED
MAINTENANCE MANUAL

R ENGINE NO. 2 GEARBOX BREATHER OVERBOARD DUCTING
R REMOVAL AND INSTALLATION

R 1. Equipment and Materials

R Protective caps

R Sealing Compounds, LAC C-40-745, Stabond Corp., NO. HT-4, or
R equivalent

R 2. Referenced Procedures

R 20-51-04 Environmental Sealings - Maintenance Practices

R 71-12-01 LH Lower Hinged Cowl - Removal and Installation

R 3. Removal/Installation

R A. Removal

R (1) On pilots center console, tag power control and thrust
R reverser levers.

R (2) Open LH lower hinged cowl (Ref. 71-12-01).

R (3) Remove clamps connecting lower hose to duct and outlet
R (Ref. Fig. 401).

R (4) Remove nuts, washers, screws, saddle clamp and lower
R hose.

R (5) Remove remaining clamp, nuts, washers, screws and
R saddle clamp from duct. Remove duct.

R (6) Remove remaining clamp from upper hose and remove upper
R hose.

R (7) Remove, nuts, washers, bolts and mast.

R (8) Install protective caps on all exposed openings.

R B. Installation

R (1) Remove protective caps.

R (2) Clean and apply sealant to area where mast is to be
R installed (Ref. 20-51-04).

EFFECTIVITY: ALL

0028

71-70-05
Page 401
May 15/88

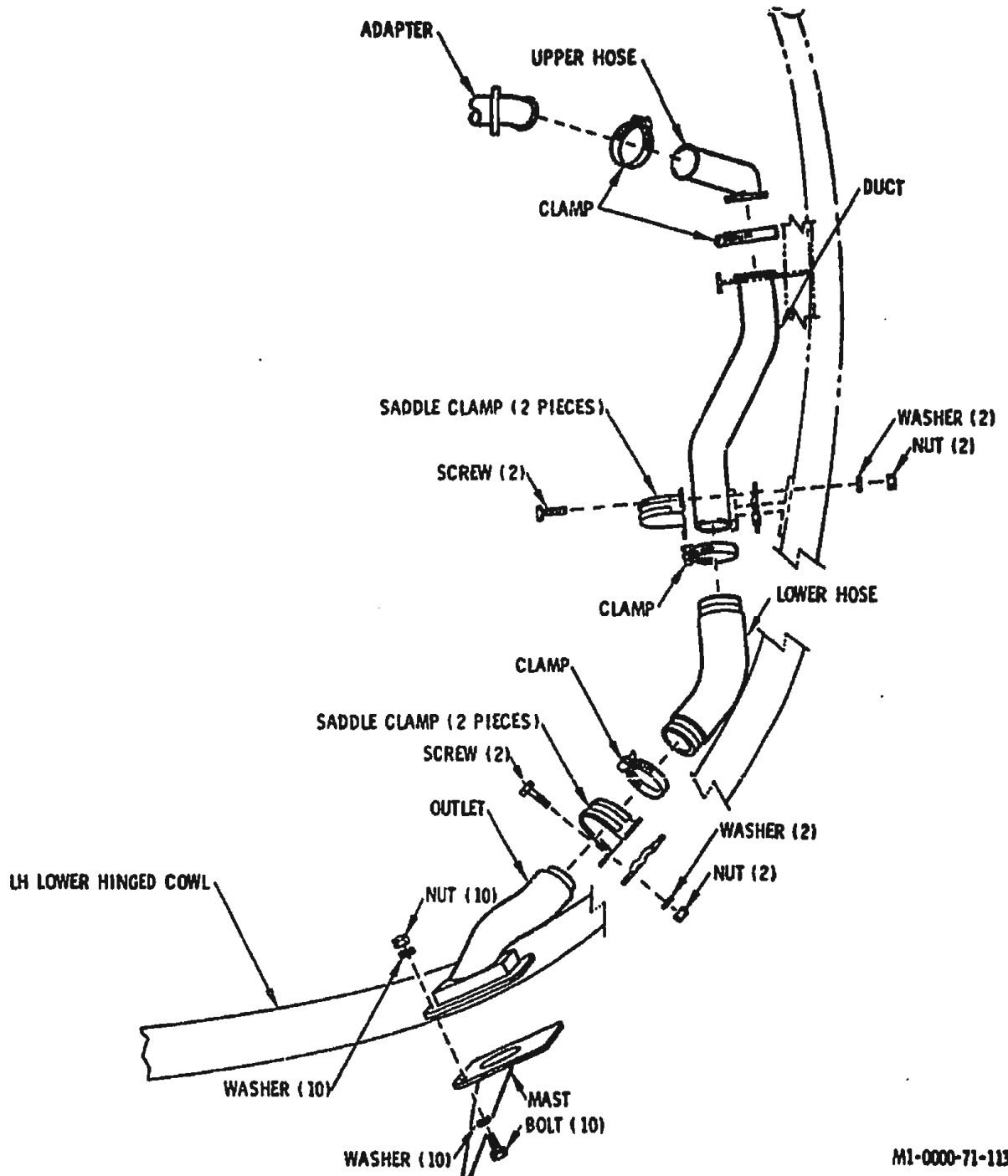
LOCKHEED
MAINTENANCE MANUAL

- R (3) Install mast with bolts, washers and nuts (Ref. Fig.
R 401).
- R (4) Install upper hose on adapter with clamp.
- R NOTE: Do not fully tighten clamps until all hoses and
R ducts are aligned.
- R (5) Install duct on upper hose with clamp and secure to
R cowl with saddle clamp, screws, washers and nuts.
- R (6) Install lower hose on outlet and duct with clamps and
R secure to cowl with saddle clamp, screws, washers and
R nuts.
- R (7) Tighten all loose clamps.
- R (8) Close LH lower hinged cowl (Ref. 71-12-01).
- R (9) Remove tags from power control and thrust reverser
R levers.

002B EFFECTIVITY: ALL

71-70-05
Page 402
May 15/88

LOCKHEED
MAINTENANCE MANUAL



M1-0000-71-113

Engine No. 2 Gearbox Breather Overboard Ducting
Removal and Installation
Figure 401

R
R
R

EFFECTIVITY: ALL

002B

71-70-05
Page 403/404
May 15/88



RB.211 Propulsion System

MAINTENANCE

R FUEL DRAIN TANK - REMOVAL/INSTALLATION

R 1. Removal/Installation Fuel Drain Tank

R Referenced Procedures:

- R 70-02-01 - Identification, Lubrication and Fitting of Rubber
- R Sealing Rings
- R 71-11-00 - Cowling, Engines No.1 and No.3 - Servicing
- R 71-12-01 - L.H. and R.H Lower Hinged Cowls - Servicing
- R 71-70-07 - Combination Float/Ejector Valve - Maintenance Practices
- R 73-00-00 - Engine Fuel and Control - Servicing

R Service Bulletin referred to:

- R S.B.71-4437 - Fuel drains tank collector and mount. Simplified
- R manufacture with revised tube runs and clipping.

R A. Remove Fuel Drain Tank

- R (1) On pilots overhead control panel, Zone 210, pull
- R appropriate Fire Emergency Shut-off Control.
- R (2) Open right-hand hinged cowl, 414A or 424A for engines
- R No.1 and 3 (Ref.71-11-00) or 434AR for engine No.2
- R (Ref.71-12-01).
- R (3) Drain L.P. fuel system (Ref.73-00-00).
- R (4) Remove combination float/ejector valve (Ref.71-70-07).
- R (5) Engines without S.B.71-4437, refer to Fig.401 (Sheet 1).
- R (a) Remove bolts (3) and disconnect connector (2).
- R (b) Release clips (7) and (9), ensure spacer (8) and
- R bolt (10) are retained.
- R (c) Remove bolts (11), remove bracket (5) and blanking
- R plate.
- R (d) Remove bolts (14) and disconnect connector (13).
- R (e) Remove bolts and nuts (15) and (16), then remove
- R fuel drain tank (17).

R EFFECTIVITY: ALL

R
050B

71-70-06

Page 401
Dec 15/93

1A



RB.211 Propulsion System

MAINTENANCE

- R (f) Remove and discard seal rings (1), (4) and (12).
- R (6) Engines with S.B.71-4437, refer to Fig.401 (Sheet 2).
- R (a) Remove bolts (1) and (4), disconnect connectors
R (2) and (5).
- R (b) Remove bolts and nuts (7) and (9), then remove
R fuel drain tank (8).
- R (c) Remove and discard seal rings (3) and (6).
- R (7) Fit approved blanks to all exposed apertures.
- R B. Install Fuel Drain Tank
- R (1) Ensure system is deactivated as detailed in operation
R 1.A.(1).
- R (2) Remove blanks from all apertures.
- R (3) Engines without S.B.71-4437, refer to Fig.401 (Sheet 1).
- R (a) Fit and lubricate (Ref.70-02-01) new seal rings as
R follows: Seal ring (1) to connector (2), seal ring
R (12) to connector (13), seal ring (4) to blanking
R plate.
- R (b) Locate fuel drains tank (17) on its support
R brackets and secure with bolts and nuts (15)
R and (16).
- R (c) Connect and secure connector (13) with bolts (14).
- R (d) Connect and secure connector (2) with bolts (3).
- R (e) Fit and secure the blanking plate and bracket (5)
R with bolts (11).
- R (f) Secure clips (9) and (7) to bracket (5) with bolt
R (10), spacer (8) and clip nut (6).
- R (4) Engines with S.B.71-4437, refer to Fig.401 (Sheet 2).
- R (a) Fit and lubricate (Ref.70-02-01) new seal rings as
R follows: Seal ring (3) to connector (2), seal
R ring (6) to connector (5).



BB.211 Propulsion System

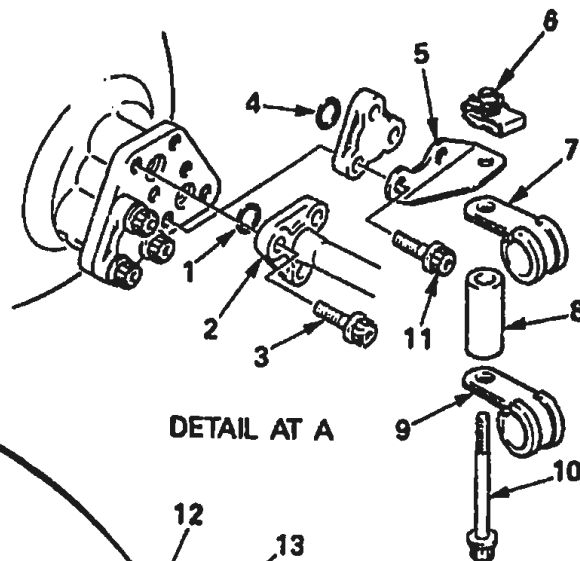
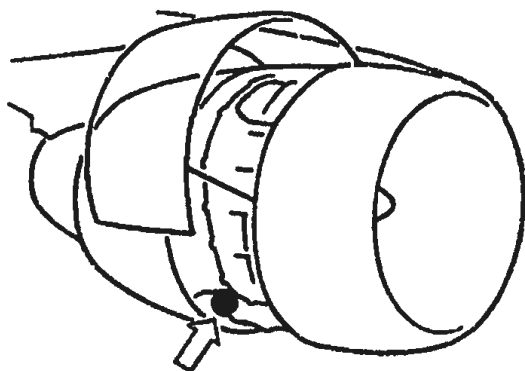
MAINTENANCE

- R (b) Locate fuel drain tank (8) on its support brackets
R secure with bolts and nuts (7) and (9).
- R (c) Connect and secure connector (2) with bolts (1).
- R (d) Connect and secure connector (5) with bolts (4),
- R (5) Fit the combination float/ejector valve (Ref.71-70-07).
- R (6) Reactivate system deactivated in operation 1.A.(1).
- R (7) Prime L.P. fuel system (Ref.73-00-00).
- R (8) Close right-hand hinged cowl, 414A or 424A for engines
R No.1 and 3 (Ref.71-11-00) or 434AR for engine No.2
R (Ref.71-12-00).

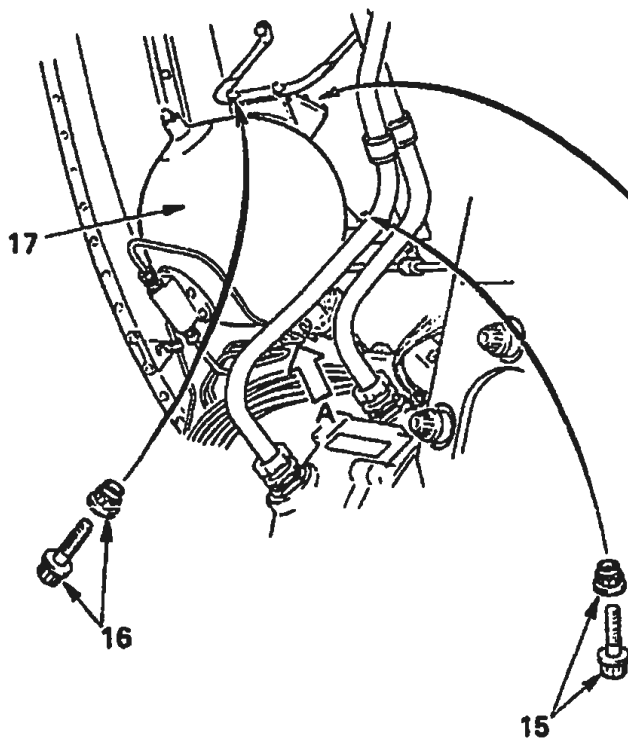
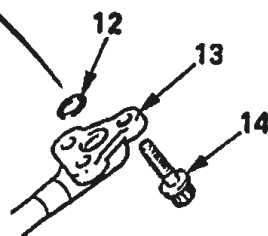


RB.211 Propulsion System

MAINTENANCE



DETAIL AT A



FORWARD →

- 1 Seal ring
- 2 Connector, shut-off valve to fuel drain tank
- 3 Bolt (3 off)
- 4 Seal ring
- 5 Bracket
- 6 Nut clip
- 7 Clip
- 8 Spacer
- 9 Clip
- 10 Bolt
- 11 Bolt (3 off)
- 12 Seal ring
- 13 Connector, fuel drain tank to bulkhead disconnect
- 14 Bolt (3 off)
- 15 Bolt and nut (3 off)
- 16 Bolt and nut (2 off)
- 17 Fuel drain tank

C3564A

Fuel Drain Tank - Removal/Installation (Engines without S.B.71-4437) Fig.401 (Sheet 1)

R
R
R

EFFECTIVITY: ALL

050B

71-70-06

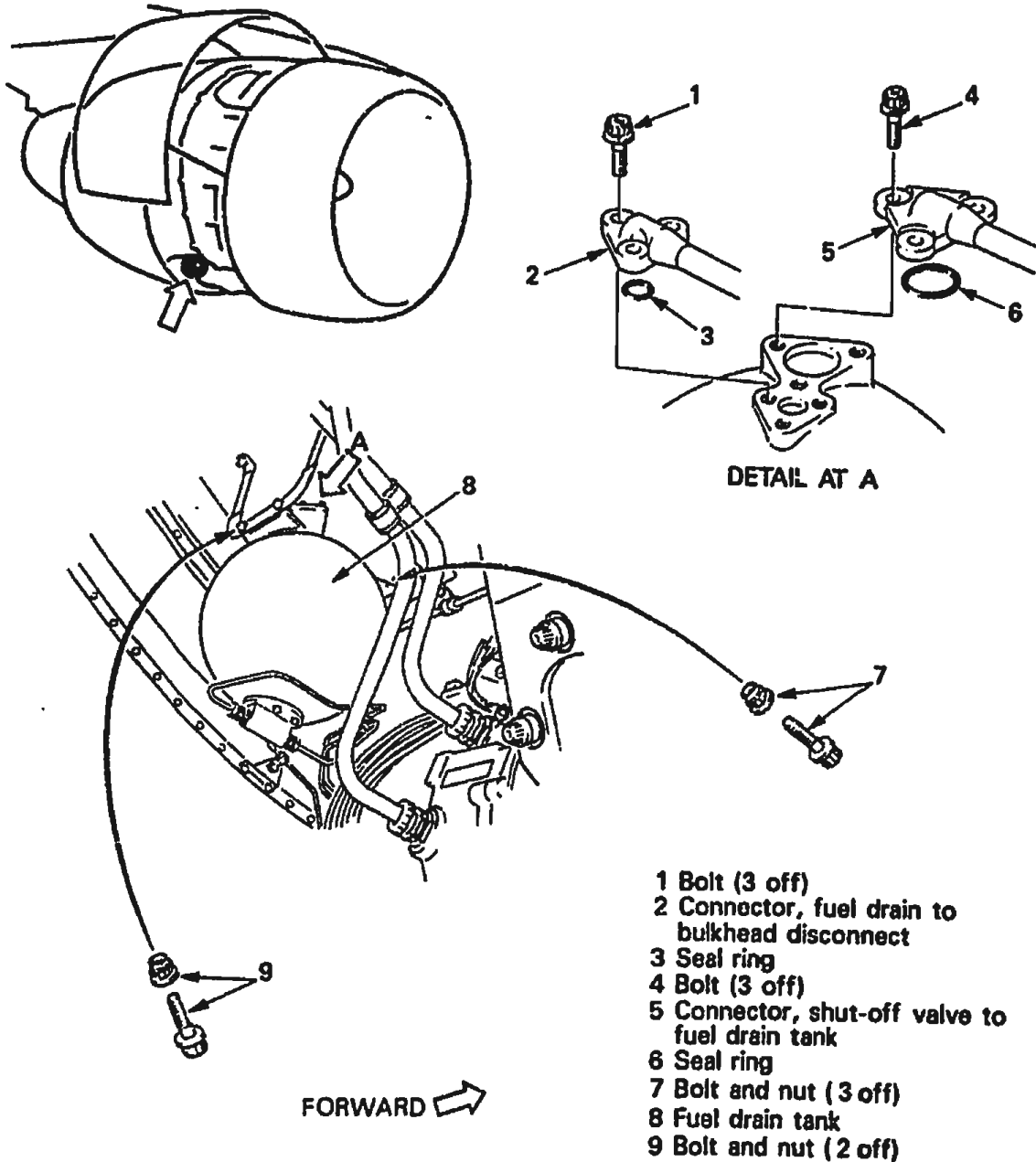
Page 404
Dec 15/93

1A



RB.211 Propulsion System

MAINTENANCE



C3565A

Fuel Drain Tank - Removal/Installation (Engines with S.B.71-4437) Fig.401 (Sheet 2)

R
R
R

R EFFECTIVITY: ALL

050B

1A

71-70-06
Page 405/406
Dec 15/93



FUEL DRAIN TANK - INSPECTION/CHECK

1. Inspect Fuel Drain Tank Assembly

Referenced Procedures:

- 71-11-00 - Cowling, Engines No.1 and No.3 - Servicing
- 71-12-01 - L.H. and R.H. Lower Hinged Cowls - Servicing
- 71-70-06 - Fuel Drain Tank - Removal/Installation

A. Open right-hand hinged cowl, 414A or 424A for engines No.1 and 3 (Ref. 71-11-00) or 434AR for engine No.2 (Ref. 71-12-01).

B. Inspect fuel drain tank.

R (1) Visually inspect fuel drain tank assembly for cracks and
R dents.

NOTE: The fuel drain tank is located near the base of the engine between the IDG and the IDG air cooled oil cooler.

C. Acceptance Standards for fuel drain tank.

R (1) Cracks

R (a) Cracks in the fuel drain tank are not acceptable.
If cracked replace fuel drain tank (Ref. 71-70-06).

R (2) Dents

R (a) Dents at or near the tank weld are not acceptable:
R replace fuel drain tank (Ref.71-70-06).

R (b) Smooth dents of large area relative to their depth
R are acceptable. Such dents must not exceed 2in.
R (50mm.) across, and their depth must not exceed
R 10% of the smallest dimension across the dent.

D. Close right-hand hinged cowl, 414A or 424A for engines No.1 and 3 (Ref. 71-11-00) or 434AR for engine No.2 (Ref. 71-12-00).

EFFECTIVITY: ALL

050B

1A

71-70-06
Page 601/602
Jun 15/95



RB.211 Propulsion System

MAINTENANCE

COMBINATION FLOAT/EJECTOR VALVE - MAINTENANCE PRACTICES

The maintenance practices detailed in this section are as follows:

Paragraph

Procedure

1. Removal/Installation Combination Float/Ejector Valve
2. Removal/Installation Ejector Inlet Filter
3. Cleaning/Painting
 - A. Clean Ejector Inlet Filter

1. Removal/Installation Combination Float/Ejector Valve

Referenced Procedures

- | | |
|----------|---|
| 71-11-00 | Cowling, Engines No.1 and No.3 - Servicing |
| 71-12-01 | L.H. and R.H. Lower Hinged Cowl - Servicing |
| 73-00-00 | Engine Fuel and Control - Servicing |

Illustrated Parts Catalogue References

The I.P.C. sections where parts disturbed during the following operations can be located are as follows:

- 73-11-09 L.P. Fuel Self Consuming Drains.

A. Remove Combination Float/Ejector Valve

(1) Equipment required:

Clean receptacle - capacity

- | | |
|------|------------------|
| 5.0 | U.S. gallons |
| 4.0 | Imperial gallons |
| 18.0 | Litres |

- (2) Open right-hand hinged cowl, 414A or 424A for engines No.1 and 3 (Ref. 71-11-00) or 434AR for engine No.2 (Ref. 71-12-01).
- (3) On pilots overhead control panel, zone 210, pull appropriate Fire Emergency Shut-off Control.
- (4) Drain L.P. fuel system (Ref. 73-00-00).
- (5) Refer to fig.201, disconnect connectors (1) and (2).

EFFECTIVITY: ALL



RB.211 Propulsion System

MAINTENANCE

- (6) Position receptacle and remove bolts (3) and withdraw ejector valve (4) from tank.
- (7) Fit approved blanks to all exposed apertures.

B. Install Combination Float/Ejector Valve

(1) Equipment required:

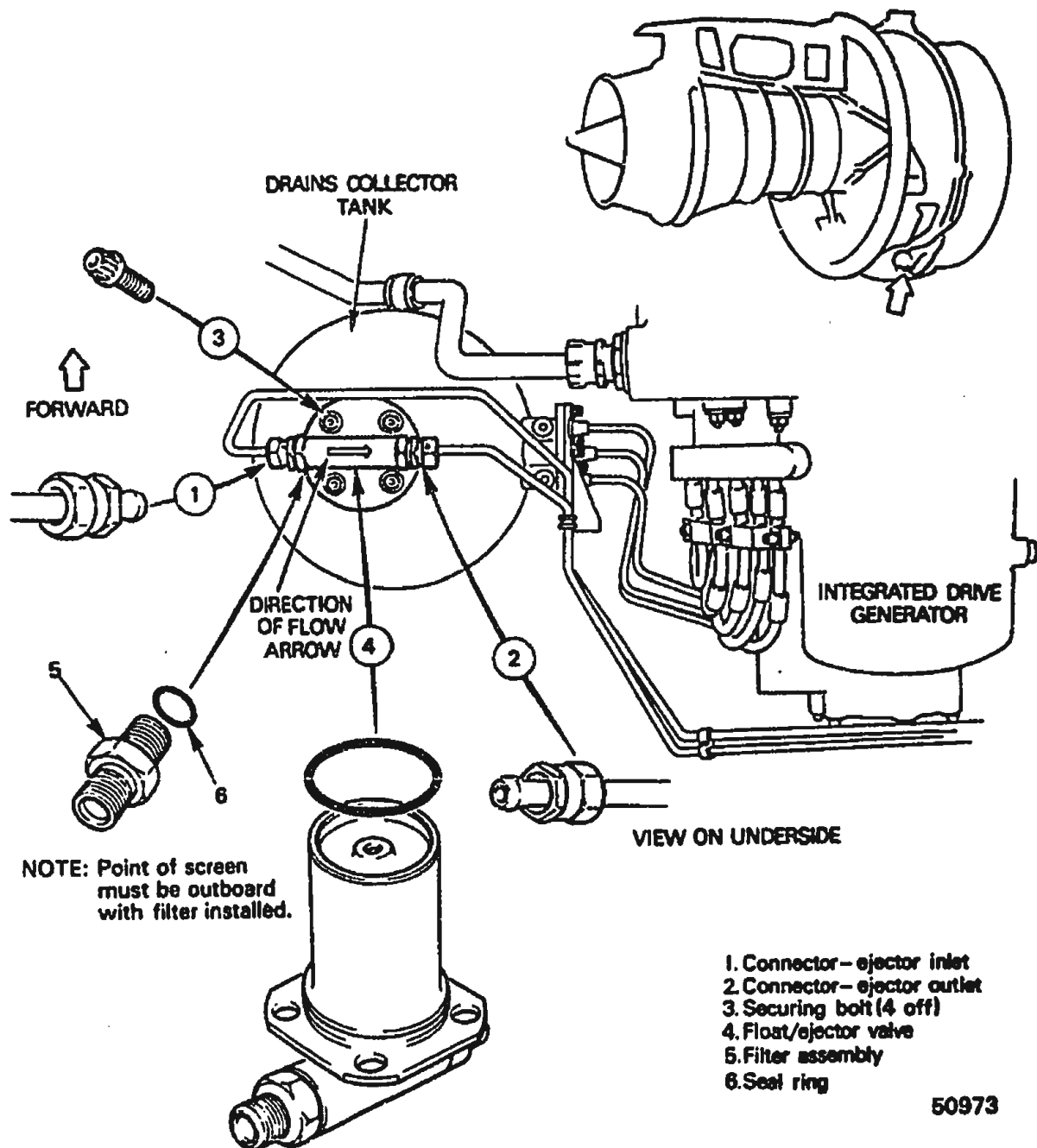
	British Spec./Ref.	American Spec./Ref.	OMat Item No.
Lockwire	DTD.189A 22 S.W.G.	- 21 A.W.G.	238

- (2) Ensure system is deactivated as detailed in operation 1.A.(3).
- (3) Remove blanks, if fitted, from all apertures.
- (4) Refer to fig.201, fit and lubricate (Ref. 70-02-01) new seal ring to ejector valve (4).
- (5) Position valve in tank ensuring that direction of flow arrow is pointing in direction illustrated in fig.201, then secure with bolts (3).
- (6) Connect and tighten connectors (2) and (1) and wirelock.
- (7) Reactivate system deactivated in operation 1.A.(3).
- (8) Prime L.P. fuel system (Ref. 73-00-00).
- (9) Close right-hand hinged cowl, 414A or 424A for engines No.1 and 3 (Ref. 71-11-00) or 434AR for engine No.2 (Ref. 71-12-01).



RB.211 Propulsion System

MAINTENANCE



Float/ejector valve and ejector inlet filter
removal/installation
Fig.201

CR
CR
CR

EFFECTIVITY: ALL

050B

16

71-70-07
Page 203
May 15/82



RB.211 Propulsion System

MAINTENANCE

2. Removal/Installation Ejector Inlet Filter

Referenced Procedures

71-11-00 Cowling, Engines No.1 and No.3 - Servicing
71-12-01 L.H. and R.H. Lower Hinged Cowl - Servicing
73-00-00 Engine Fuel and Control - Servicing

Illustrated Parts Catalogue References

The I.P.C. sections where parts disturbed during the following operations can be located are as follows:

73-11-09 L.P. Fuel Self Consuming Drains

A. Remove Ejector Inlet Filter

- (1) Open right-hand hinged cowl, 414A or 424A for engines No.1 and 3 (Ref. 71-11-00) or 434AR for engine No.2 (Ref. 71-12-01).
- (2) On pilots overhead control panel, zone 210, pull appropriate Fire Emergency Shut-off Control.
- (3) Drain L.P. fuel system (Ref. 73-00-00).
- (4) Refer to fig.201, disconnect connector (1).
- (5) Remove filter assembly (5).
- (6) Clean filter as described in para.3.
- (7) Fit blanks to exposed apertures.

B. Install Ejector Inlet Filter

(1) Equipment required:

	British Spec./Ref	American Spec./Rec.	OMat Item No.
Lockwire	DTD.189A 22 S.W.G.	- 21 A.W.G.	238

(2) Material required:

Seal ring and thread lubricant - Drilube 822 or equivalent.

EFFECTIVITY: ALL



RB.211 Propulsion System

MAINTENANCE

- (3) Ensure system is deactivated as detailed in operation 2.A.(2).
- (4) Remove blanks, if fitted, from apertures.
- (5) Refer to fig.201, apply lubricant to new seal ring (6) and filter-end threads of filter assembly (5); fit seal ring to filter-end of filter assembly.
- (6) Enter filter-end of filter assembly in ejector valve and secure, applying a torque load of between 22 to 28 lb.ft.

CR NOTE: Point of screen must be pointing outboard when
CR fitting is installed.

- (7) Connect and tighten connector (1) and wirelock.
- (8) Reactivate system deactivated in operation 2.A.(2).
- (9) Prime L.P. fuel system (Ref. 73-00-00).
- (10) Close right-hand hinged cowl, 414A or 424A for engines No.1 and 3 (Ref. 71-11-00) or 434AR for engine No.2 (Ref. 71-12-01).

3. Cleaning/Painting

A. Clean Ejector Inlet Filter

(1) Equipment required:

Small, bristle brush
Compressed air supply

(2) Material required:

White spirit	British spec. BS.245	American spec.
or Stoddard solvent		ASTM D484-52

EFFECTIVITY: ALL



RB.211 Propulsion System

MAINTENANCE

- (3) **WARNING:** USE COMPRESSED AIR WITH CARE TO PREVENT DAMAGE TO FILTER SCREEN.
Immerse filter assembly in white spirit or Stoddard solvent and agitate to clean filter screen; use brush to clean the threads. Dry filter assembly using moisture free compressed air.

EFFECTIVITY: ALL

050B

16

71-70-07
Page 206
May 15/77

**LOW POWER - FAULT ISOLATION****1. General**

The diagrams and schematics in this section can be used for fault isolation any time a fault is reported or suspected. Uncommon abbreviations are defined on the fault code diagram or schematic.

If the flight crew reports a fault using a fault code number, the code number can be found in the Fault Isolation Reference Table in the Chapter 71 Fault Code Index. The index specifies the exact maintenance manual section, fault isolation diagram, and block number on the diagram where the fault isolation procedure should start. Where applicable, schematics are included at the end of the section to supplement the fault code diagrams or as an aid in isolating a problem not covered on the diagrams.

Refer to the Maintenance Manual Introduction for a more detailed discussion of the Fault Isolation Reporting Method (FIRM) and use of fault isolation diagrams/schematics.

2. Fault Isolation/Identification

Table 101 lists the fault isolation diagrams and schematics in this section.

TABLE 101

FIGURE	TITLE
103	Low power/E.P.R. shortfall - all other indications low - throttle limited
104	Low power with N2 limited
105	E.P.R. indication low/zero - all other indications normal
106	Low power - T.G.T. high - other parameters normal
107	Engine run down with possible flame-out or No response to throttle lever movement
108	Engine flame-out
109	Auto-deceleration at constant power setting

**RB.211****Propulsion System****MAINTENANCE**

<u>COMPONENT</u>	<u>QTY</u>	<u>ACCESS/AREA</u>	<u>REFERENCE</u>
AMPLIFIER - SPEED AND TEMP CONTROL	3	ENGINE: 412, 423, 433	73-21-02
BOX - THROTTLE CONTROL	3	ENGINE: 412, 423, 433	76-11-02
CHIP DETECTOR - MAGNETIC	6	ENGINE: 412, 423, 433	72-01-00
CONNECTOR - MULTIPLE	3	ENGINE: 412, 423, 433	77-11-04
ELEMENT - FILTER	3	ENGINE: 412, 423, 433	72-01-00
FINE SCAV	3	ENGINE: 412, 423, 433	72-00-06
GEARBOX - HIGH SPEED (06 MODULE)	3	ENGINE: 412, 423, 433	77-11-02
INDICATOR - E.P.R.	3	PILOTS MAIN INST PANEL - 210	77-21-03
INDICATOR - T.G.T.	3	PILOTS MAIN INST PANEL - 210	73-11-01
PUMP - COMBINED FUEL	3	ENGINE: 412, 423, 433	73-21-01
REGULATOR - FUEL FLOW	3	ENGINE: 412, 423, 433	77-21-04
RESISTOR - T.G.T. BALLAST	3	ENGINE: 412, 423, 433	77-21-04
RESISTOR - T.G.T. TRIM	3	ENGINE: 412, 423, 433	73-21-02
SWITCH - N2 SPEED	3	ENGINE: 412, 423, 433	77-11-01
TRANSMITTER - I.E.P.R.	3	ENGINE: 412, 423, 433	72-51-03
TUBE - P8 RAKE	15	ENGINE: 412, 423, 433	75-31-01
UNIT - V.I.G.V. CONTROL	3	ENGINE: 412, 423, 433	

Component Location Index
Fig.101

R
R
050B

EFFECTIVITY: ALL

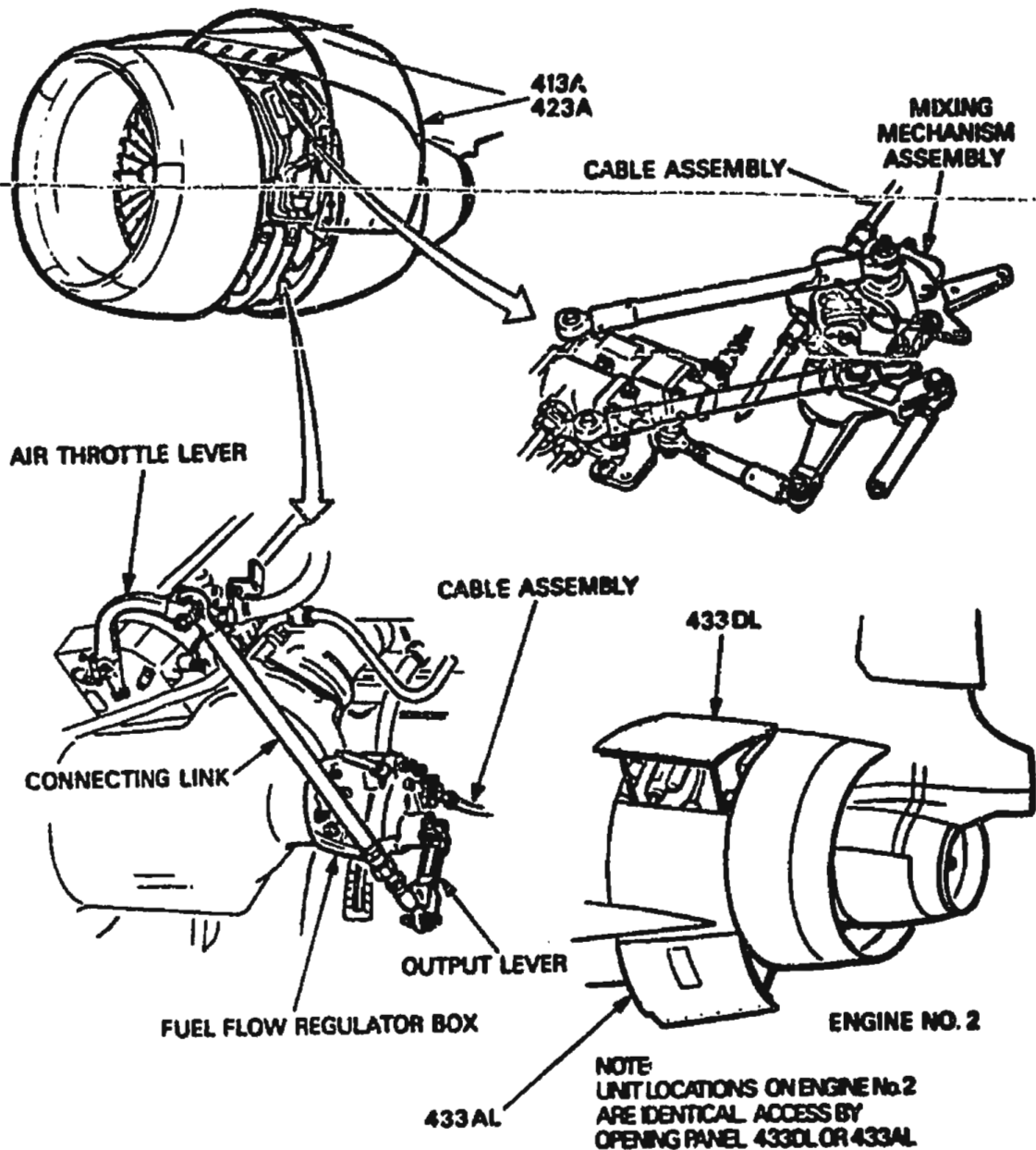
1G

71-80-00
Page 102
Nov 15/87



BB.211 Propulsion System

MAINTENANCE



37019

Component Locator Diagram
Fig.102 (Sheet 1 of 9)

R
R
050B

EFFECTIVITY: ALL

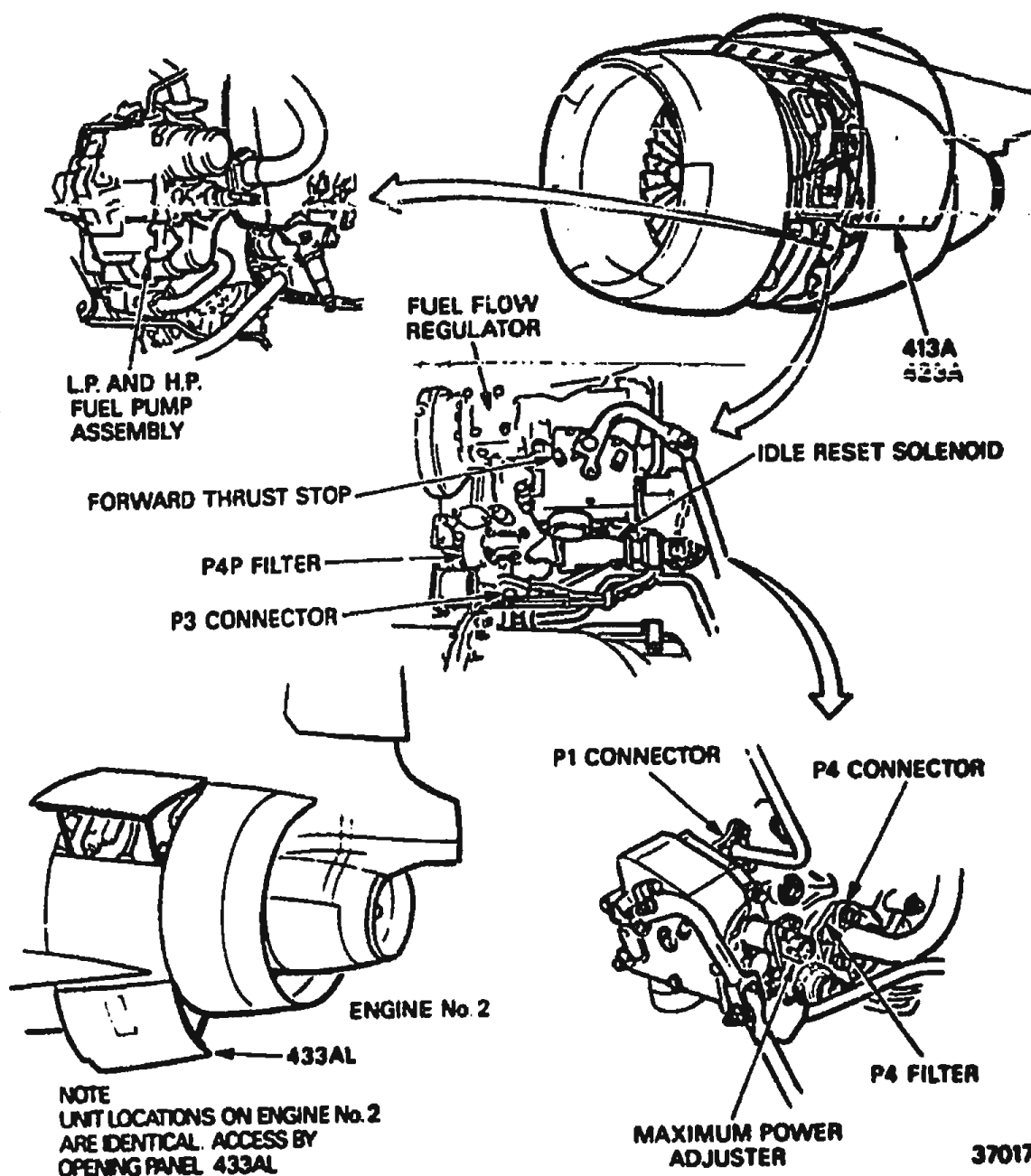
1G

71-80-00
Page 103
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



Component Locator Diagram
Fig.102 (Sheet 2 of 9)

R
R
050B EFFECTIVITY: ALL

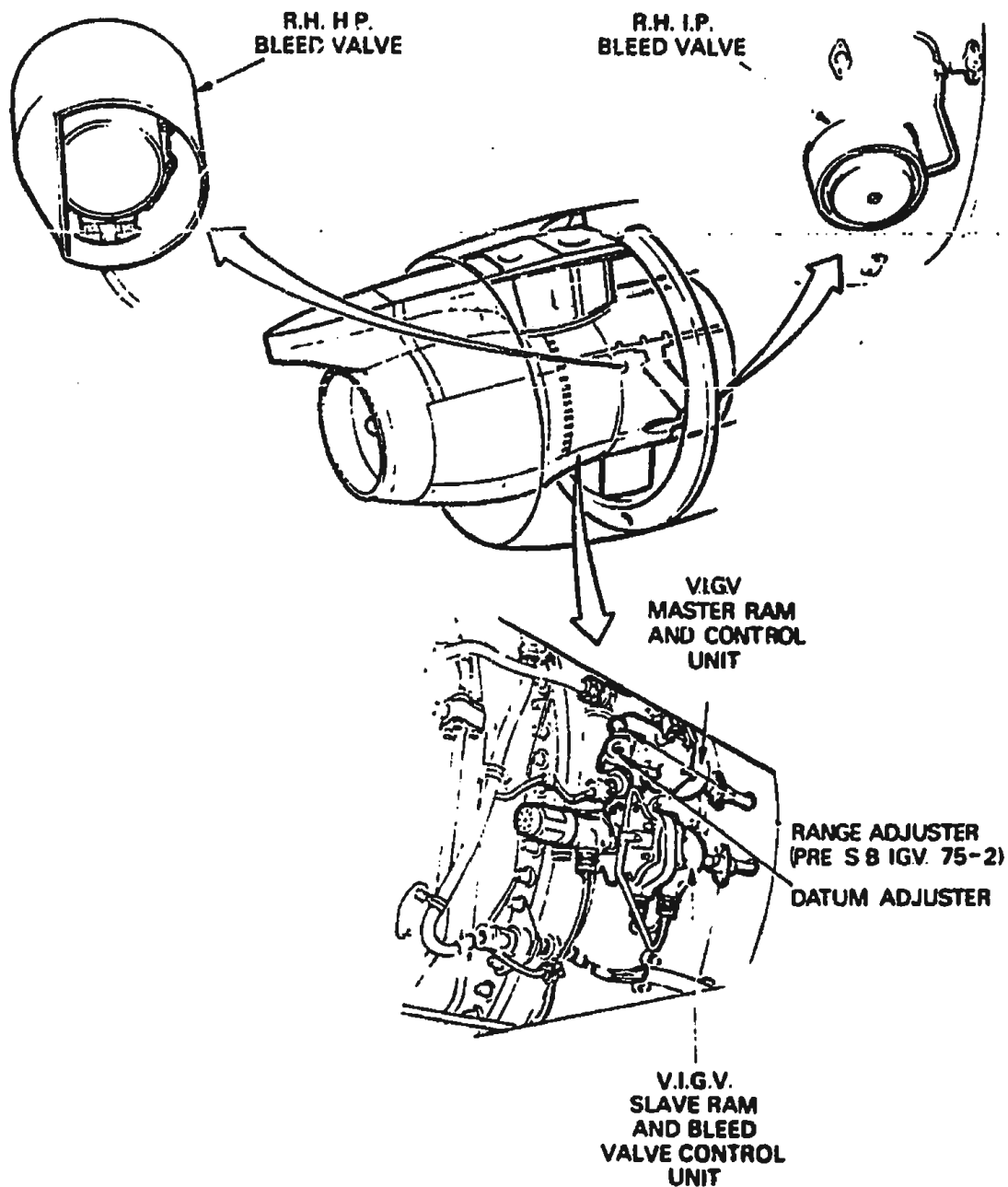
71-80-00
Page 104
Nov 15/81

1G



BB.211 Propulsion System

MAINTENANCE



37022

Component Locator Diagram
Fig.102 (Sheet 3 of 9)

R
R
0508

EFFECTIVITY: ALL

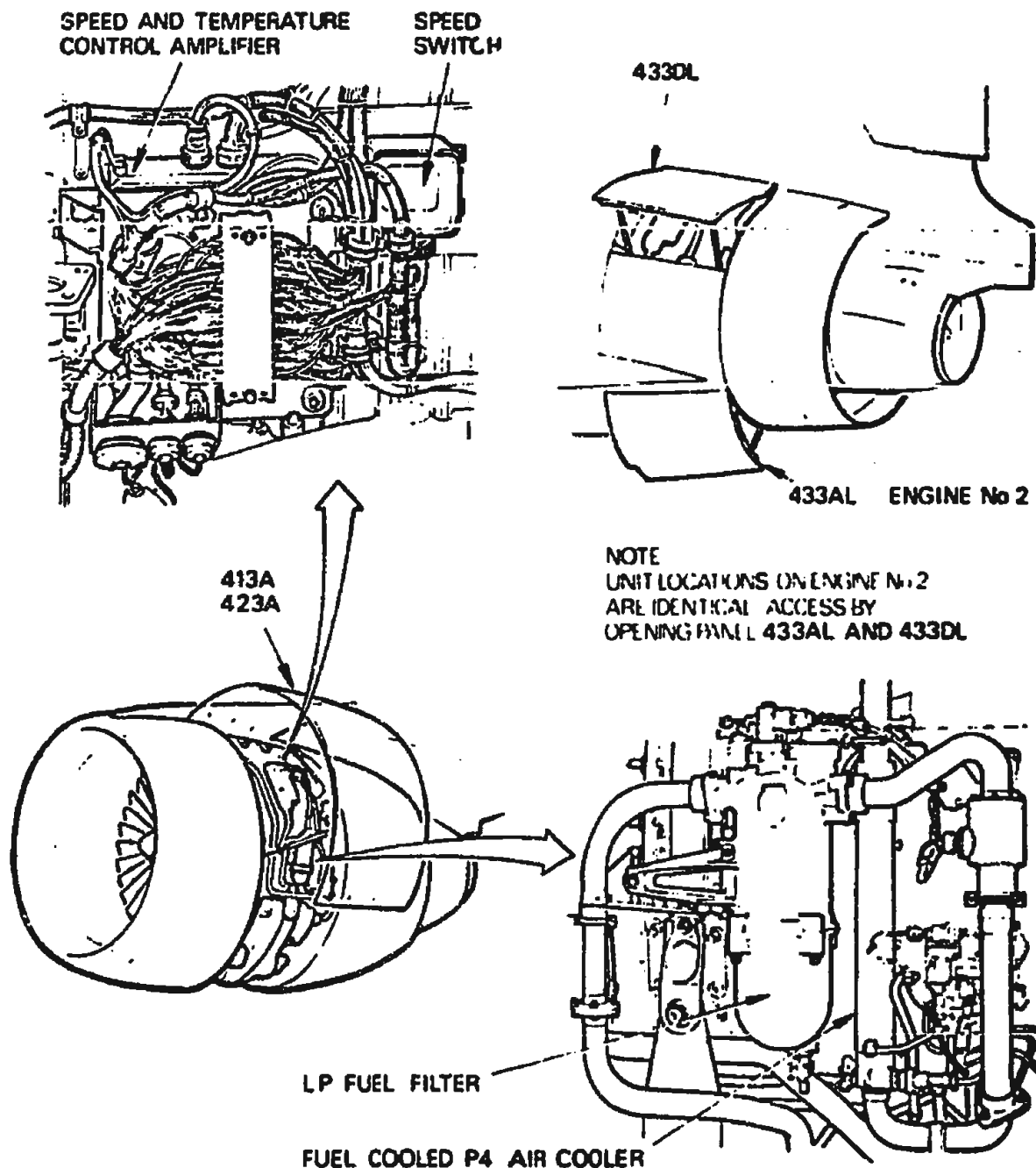
1G

71-80-00
Page 105
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



37016

Component Locator Diagram
Fig.102 (Sheet 4 of 9)

R
R
050B

EFFECTIVITY: ALL

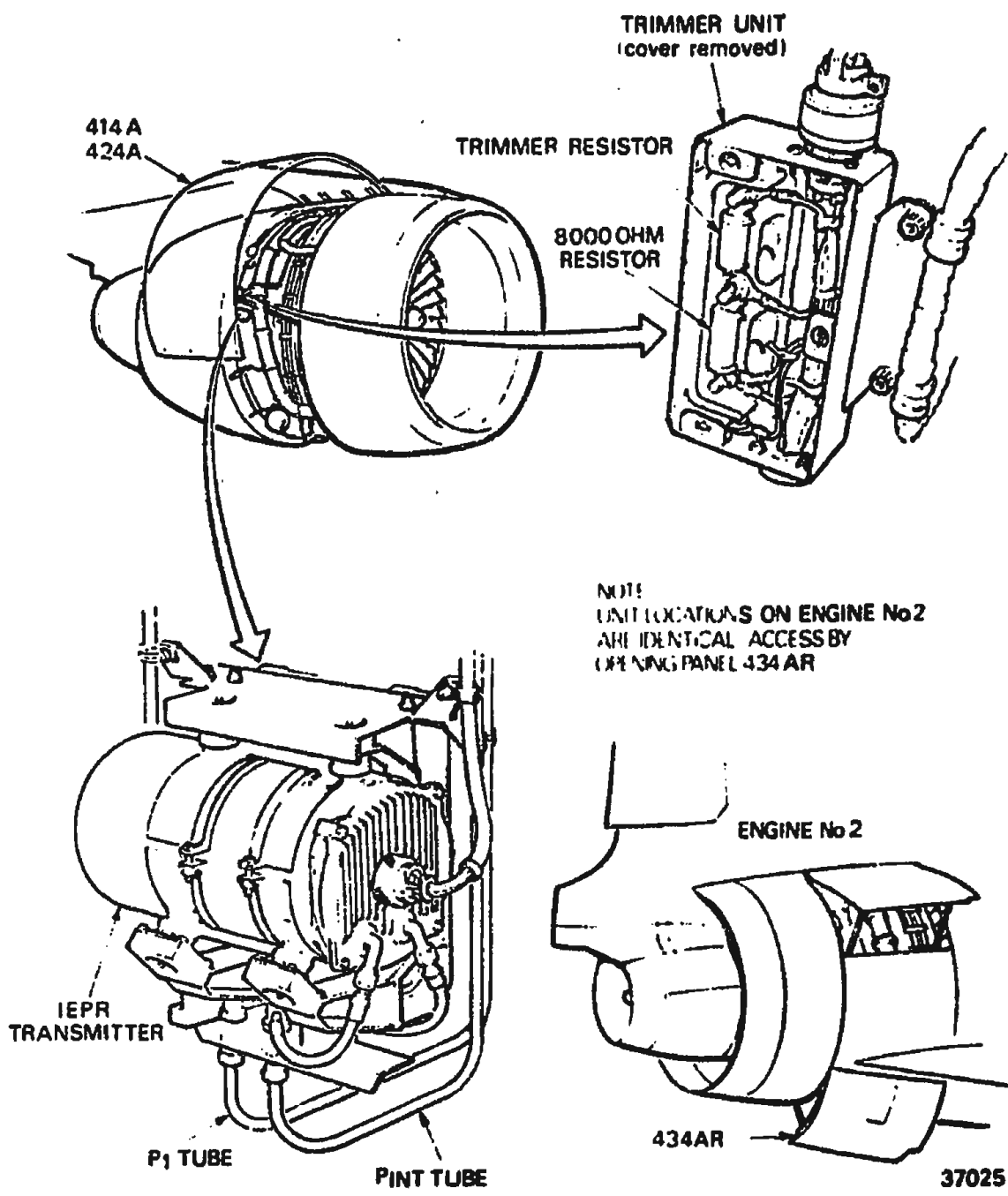
16

71-80-00
Page 106
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



Component Locator Diagram
Fig.102 (Sheet 5 of 9)

R
R
0508

EFFECTIVITY: ALL

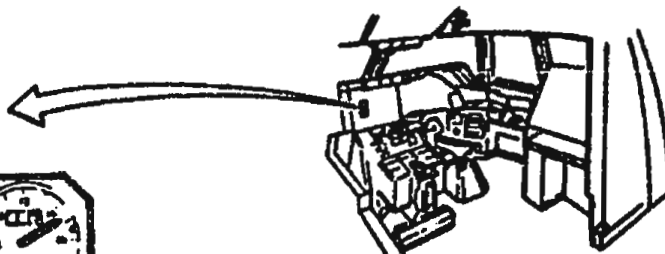
1G

71-80-00
Page 107
Nov 15/81

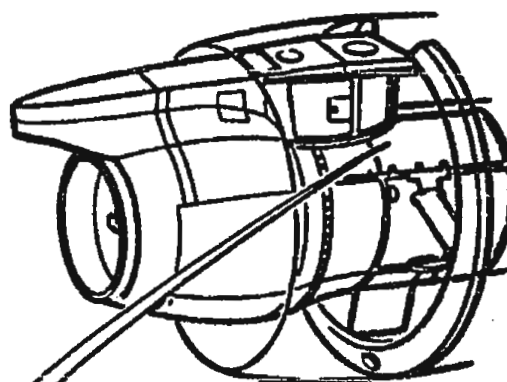


RB.211 Propulsion System

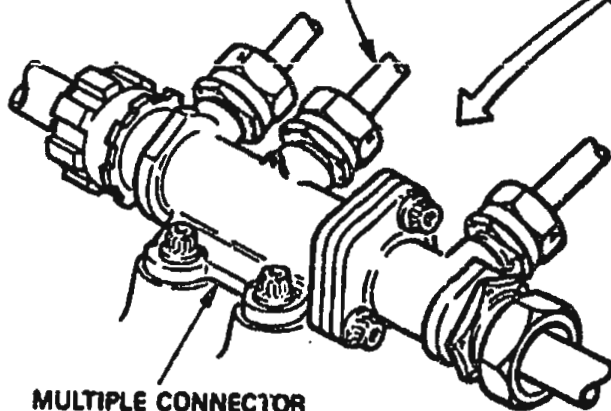
MAINTENANCE



EPR INDICATOR
(STRIP OR ROUND)



PINT TUBE



MULTIPLE CONNECTOR

37024

Component Locator Diagram
Fig.102 (Sheet 6 of 9)

R
R
0508

EFFECTIVITY: ALL

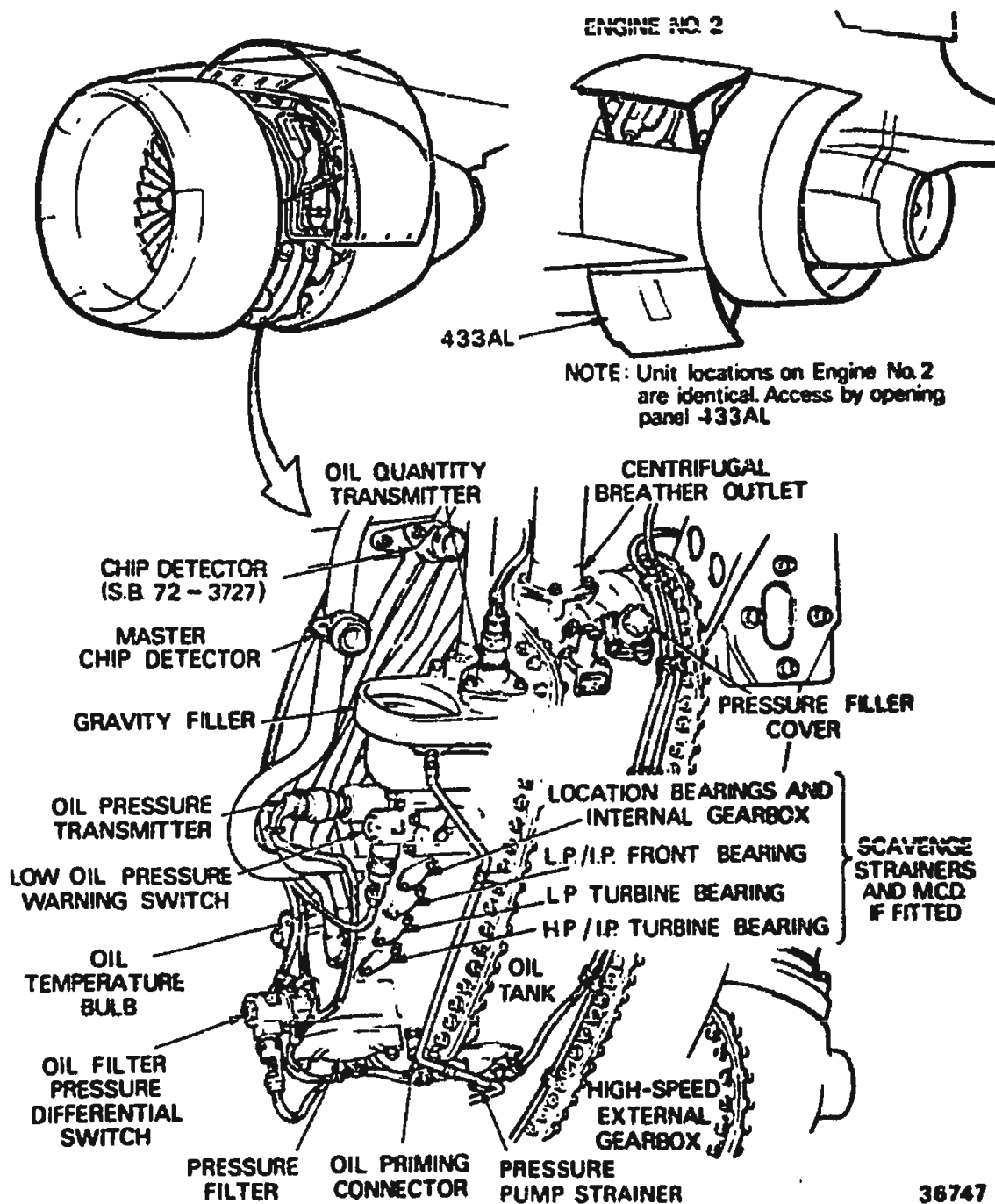
16

71-80-00
Page 108
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



Component Locator Diagram
Fig.102 (Sheet 7 of 9)

R
R

EFFECTIVITY: ALL

050B

16

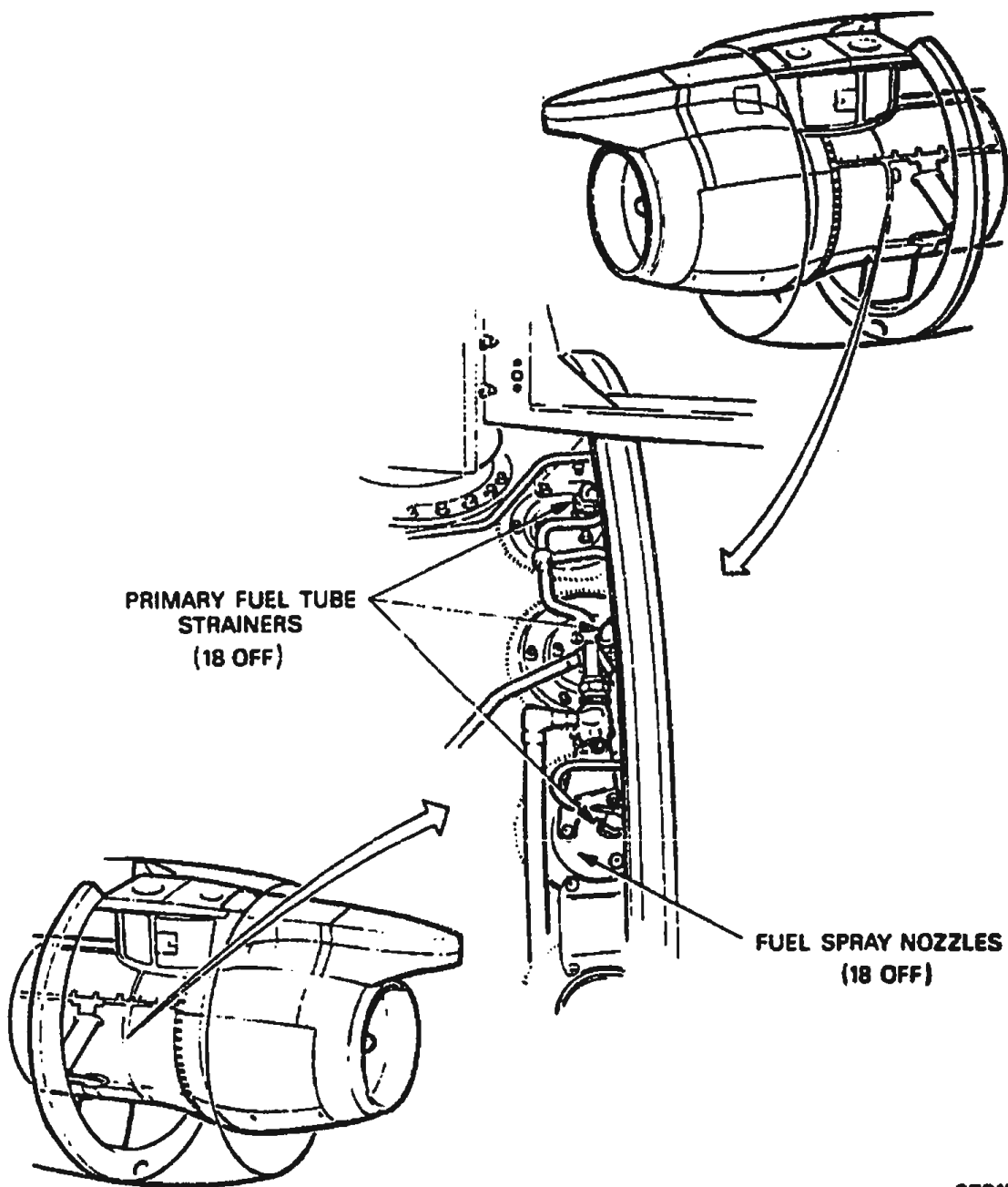
71-80-00

Page 109
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



37018

Component Locator Diagram
Fig.102 (Sheet 8 of 9)

R
R
050B

EFFECTIVITY: ALL

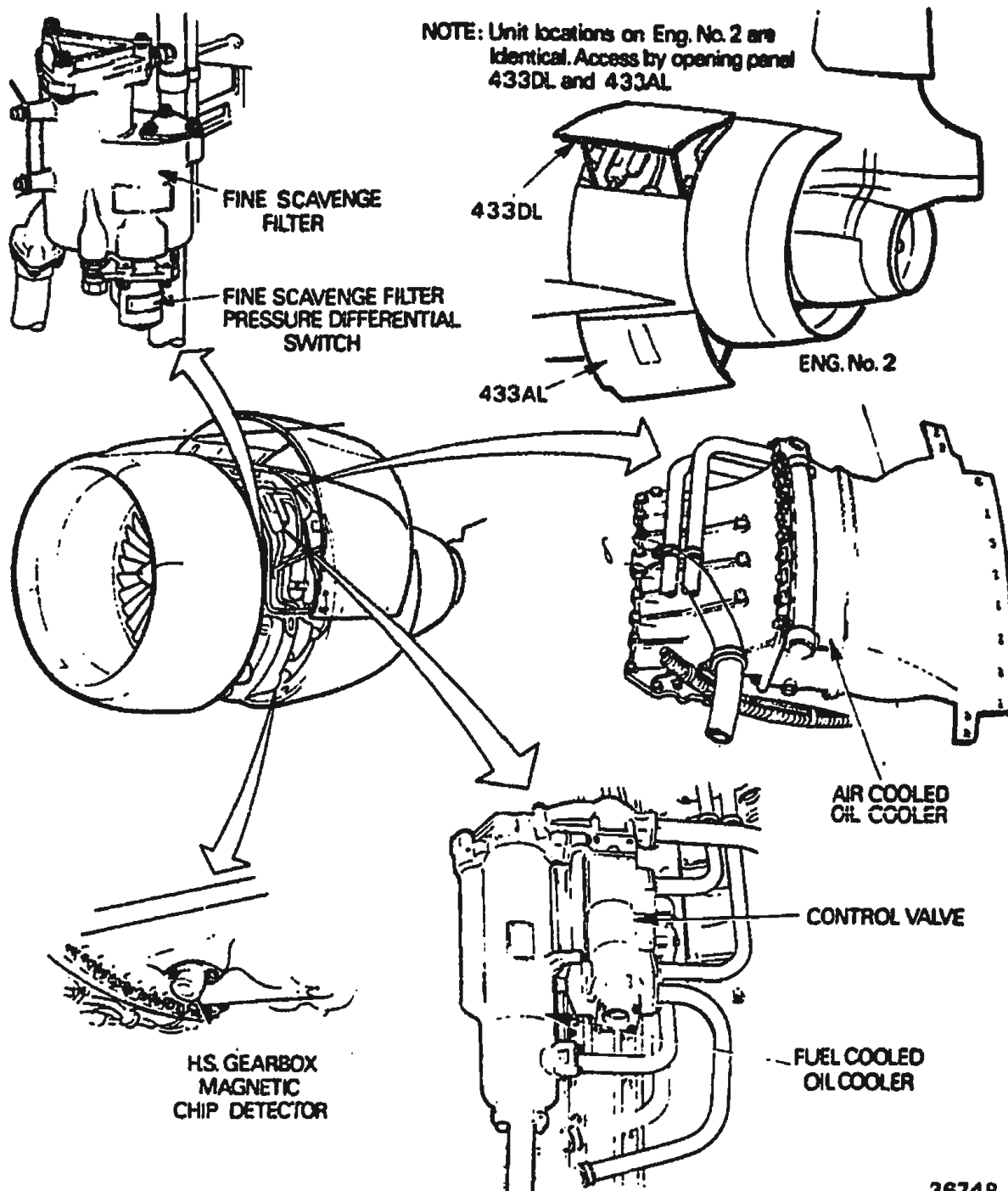
1G

71-80-00
Page 110
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



36748

Component Locator Diagram
Fig.102 (Sheet 9 of 9)

R
R
050B

EFFECTIVITY: ALL

1G

71-80-00
Page 111
Nov 15/81



RB.211 Propulsion System

MAINTENANCE

Notes referred to during fault isolation procedures:

1. Stiction of the fuel pump trim valve actuator will cause fuel trim. In some cases this may be relieved by gently percussing the trim valve actuator case with a soft faced mallet. If this is successful the pump must be changed at the earliest opportunity.
2. The internal N2 pulse probe and phonic wheel may be rubbing due to thermal expansion resulting in erroneous signal to speed and temperature control amplifier. Replace internal N2 pulse probe at next engine overhaul.

Low power/E.P.R. shortfall - all other indications low -
throttle limited
Fig.103 (Sheet 1 of 3)

R EFFECTIVITY: ALL

R
050B

1G

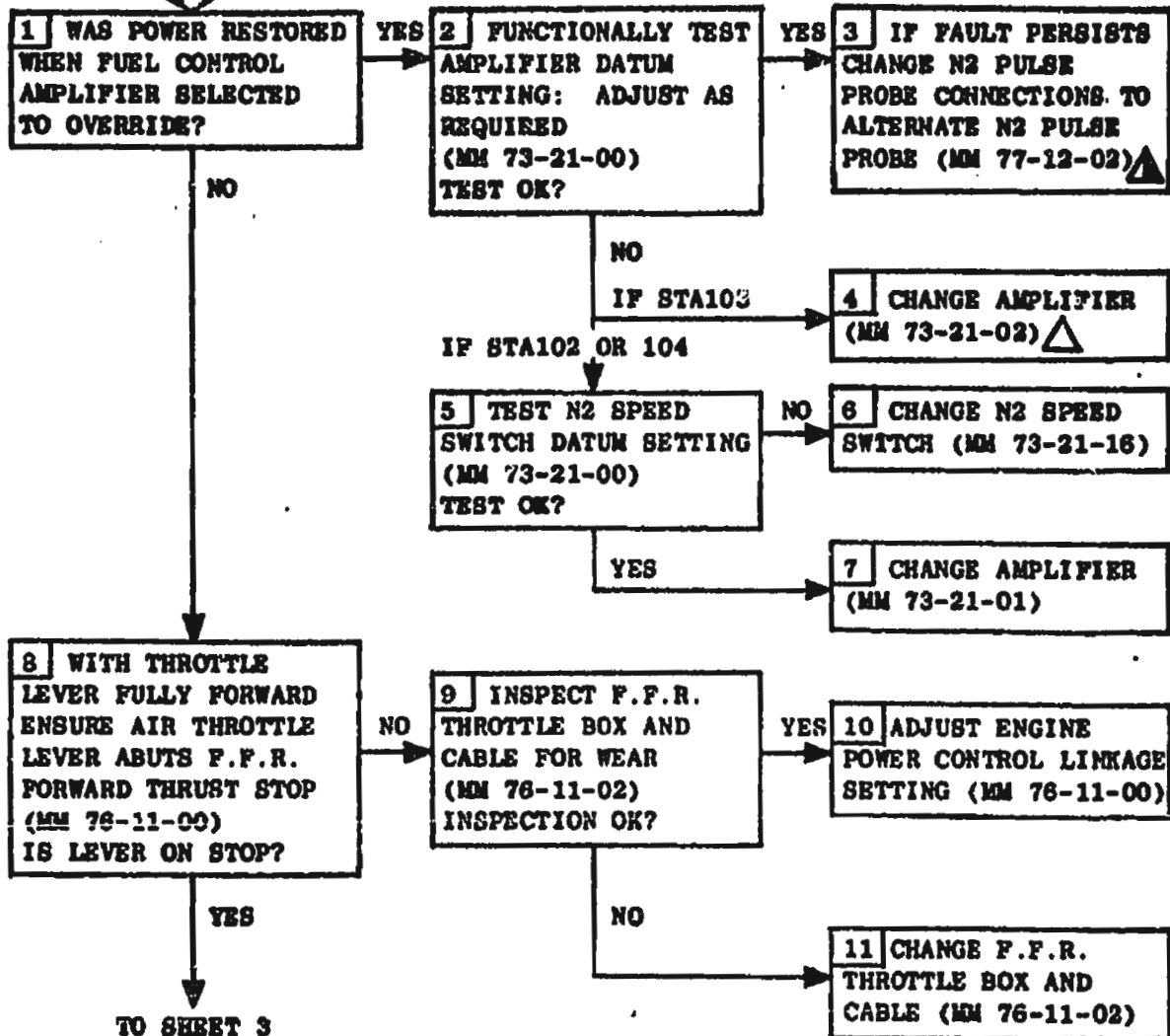
71-80-00
Page 112
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

LOW POWER/E.P.R. SHORTFALL - ALL OTHER INDICATIONS LOW - THROTTLE LIMITED



⚠ CAUTION: ON ENGINE NO.2 (AND IF FITTED TO OTHER ENGINES) THE STA103 AMPLIFIER AND THE FB100 FILTER MUST BE CHANGED TOGETHER. FAILURE TO DO SO MAY RESULT IN DAMAGE TO NEW AMPLIFIER DUE TO DEFECTIVE FB100 FILTER.

▲ SEE NOTE 1 ON SHEET 1

▲ SEE NOTE 2 ON SHEET 1

48634C

R
R
R

Low power/E.P.R. shortfall - all other indications low -
throttle limited
Fig.103 (Sheet 2 of 3)

EFFECTIVITY: ALL

71-80-00
Page 113
May 15/85

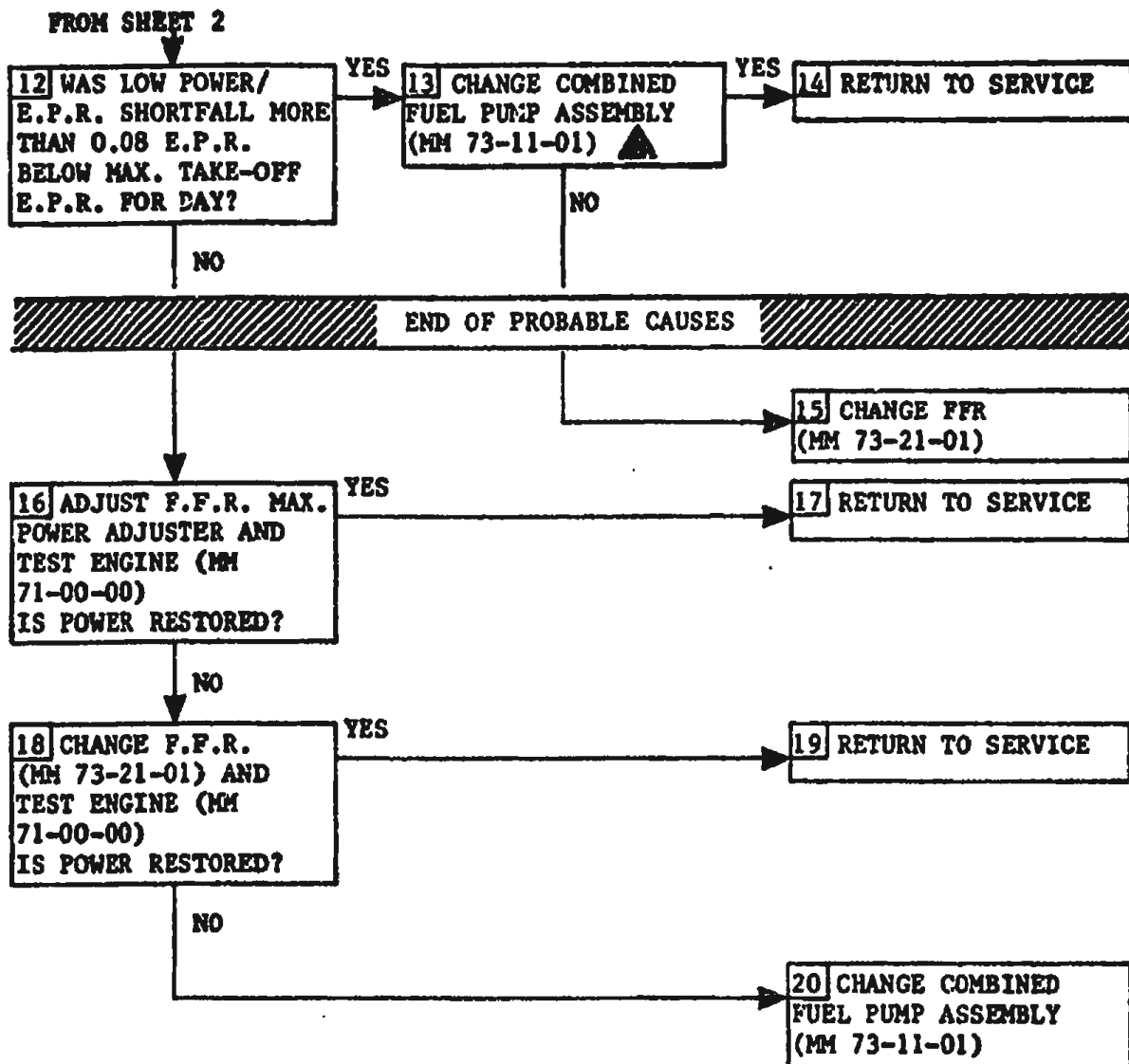
050B

1G



RB.211 Propulsion System

MAINTENANCE



50044B

R
R
R

Low power/E.P.R. shortfall - all other indications Low -
throttle limited
Fig.103 (Sheet 3 of 3)

EFFECTIVITY: ALL

050B

1G

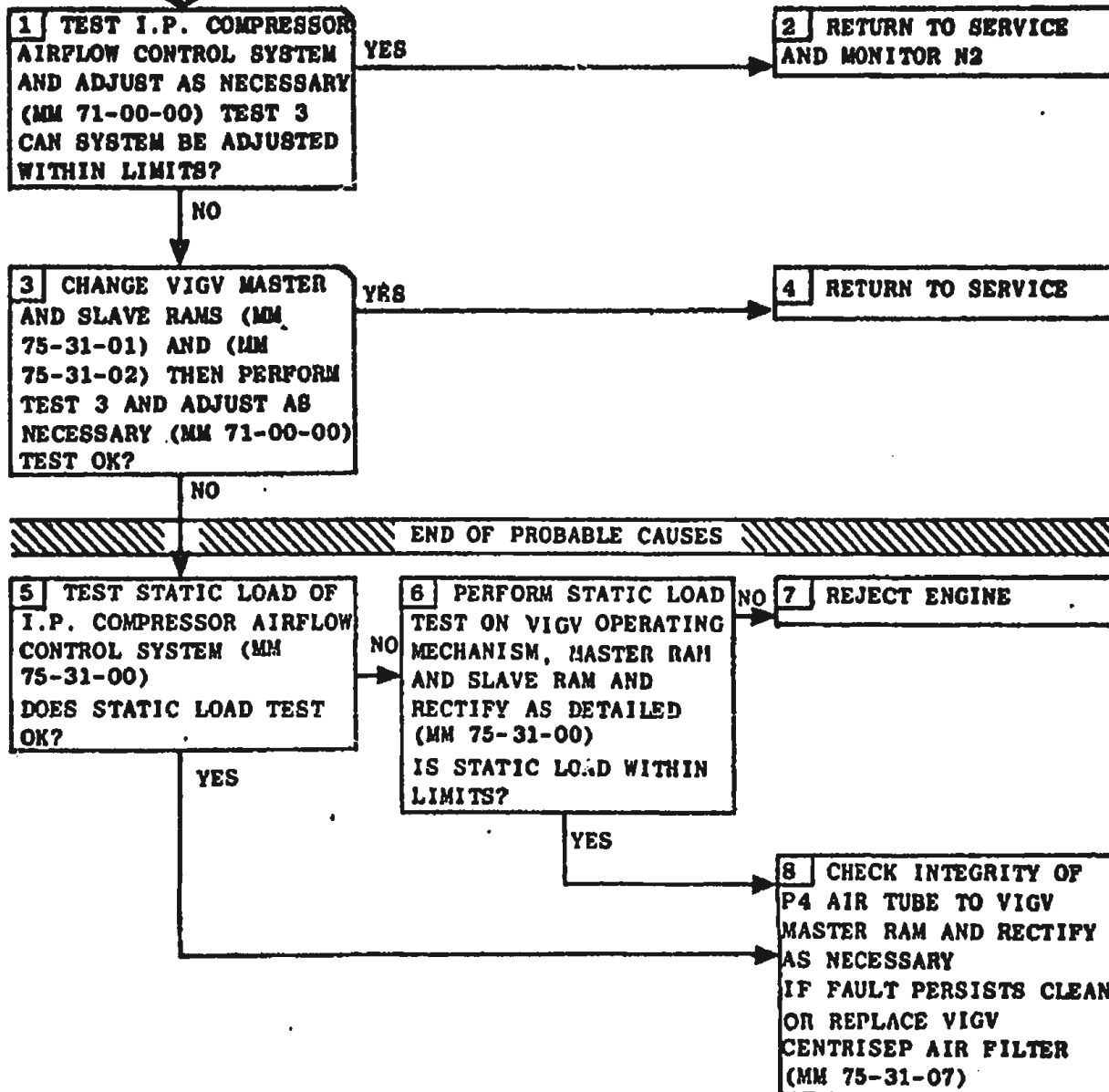
71-80-00
Page 114
Mar 15/91



RB.211 Propulsion System

MAINTENANCE

LOW POWER - N2 LIMITED



50061A

CR
CR

Low power - N2 limited
Fig.104

EFFECTIVITY: ALL

050B

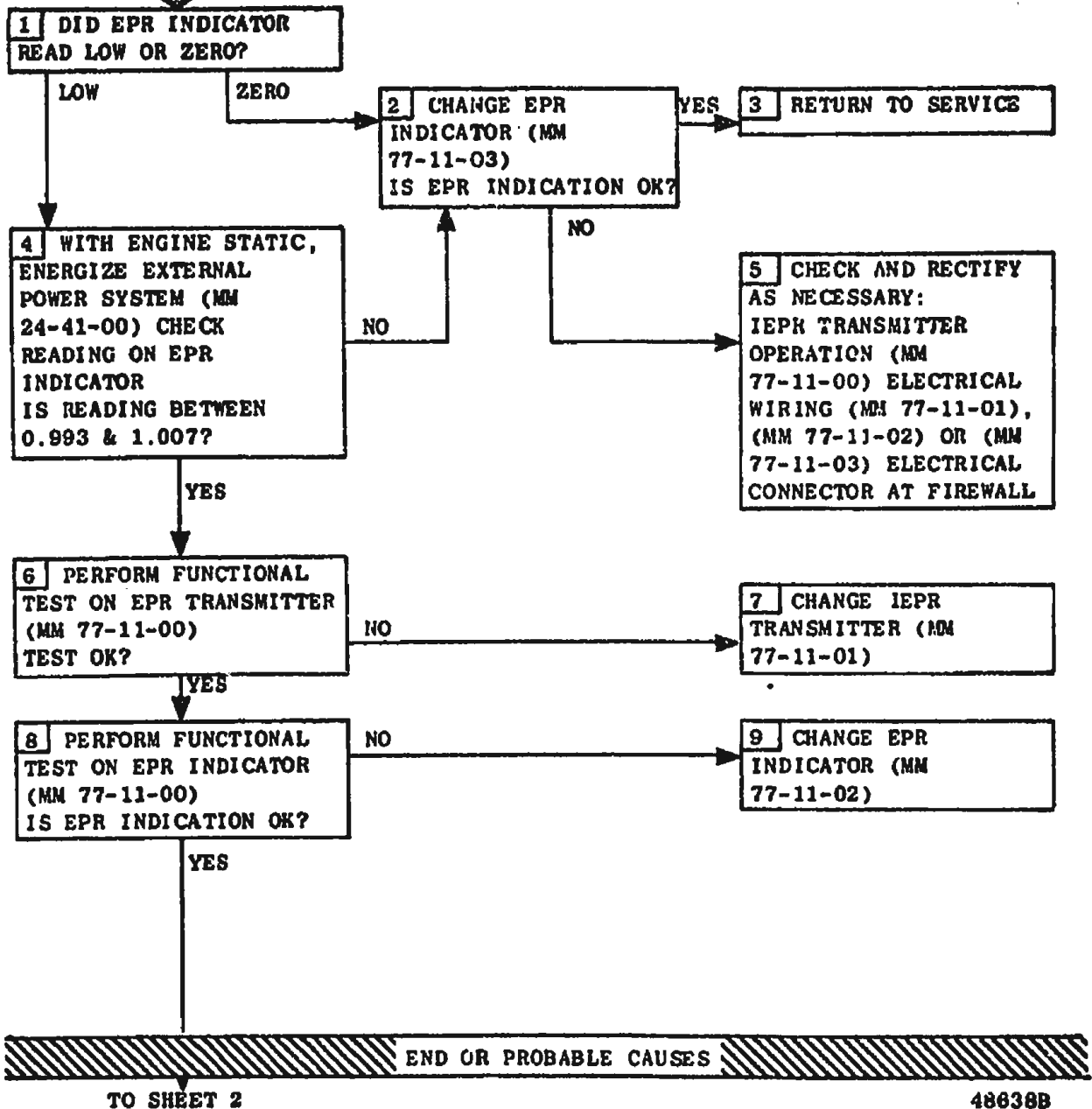
1G

71-80-00
Page 115
May 15/85



RB.211 Propulsion System MAINTENANCE

E.P.R. INDICATION LOW/ZERO -
ALL OTHER INDICATIONS NORMAL



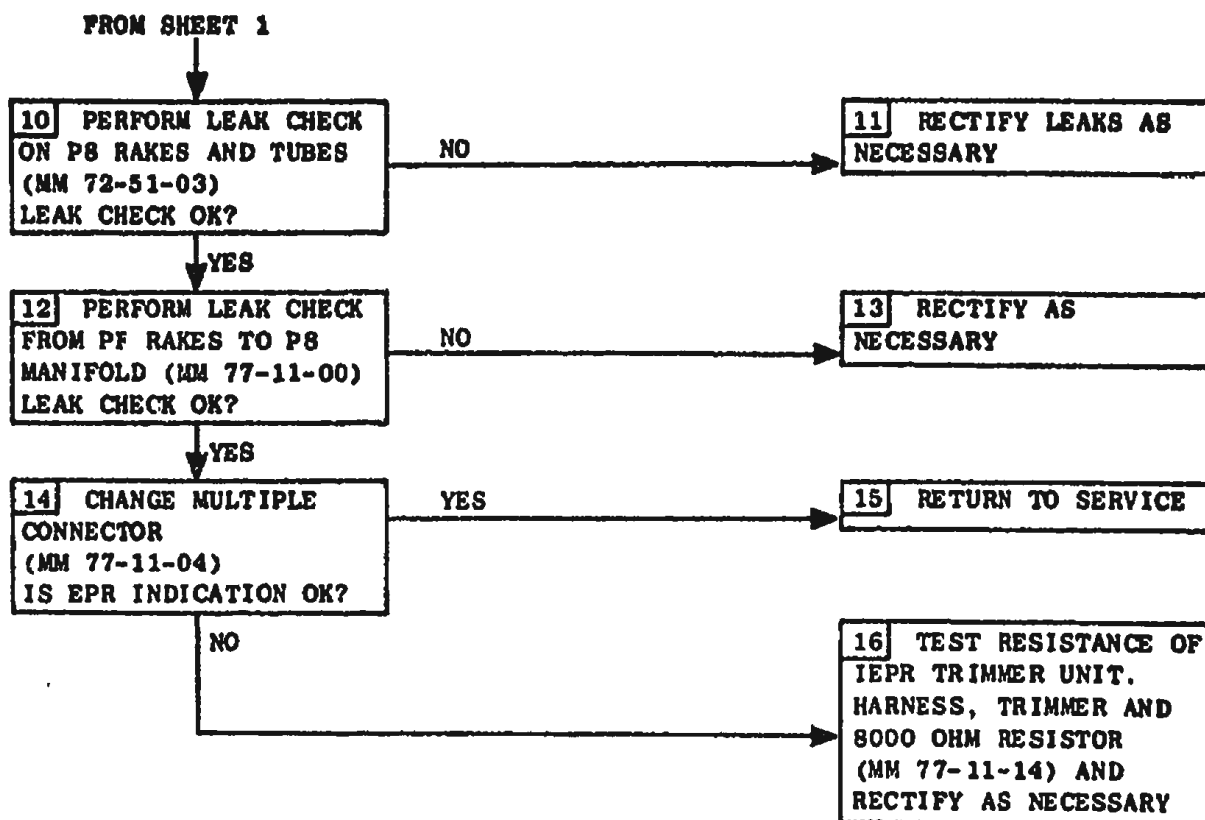
R E.P.R. indication low/zero - all other indications normal
R Fig.105 (Sheet 1 of 2)

EFFECTIVITY: ALL

71-80-00
Page 116
Nov 15/87



RB.211 Propulsion System MAINTENANCE



48639B

R
R

E.P.R. indication low/zero - all other indications normal
Fig.105 (Sheet 2 of 2)

EFFECTIVITY: ALL

050B

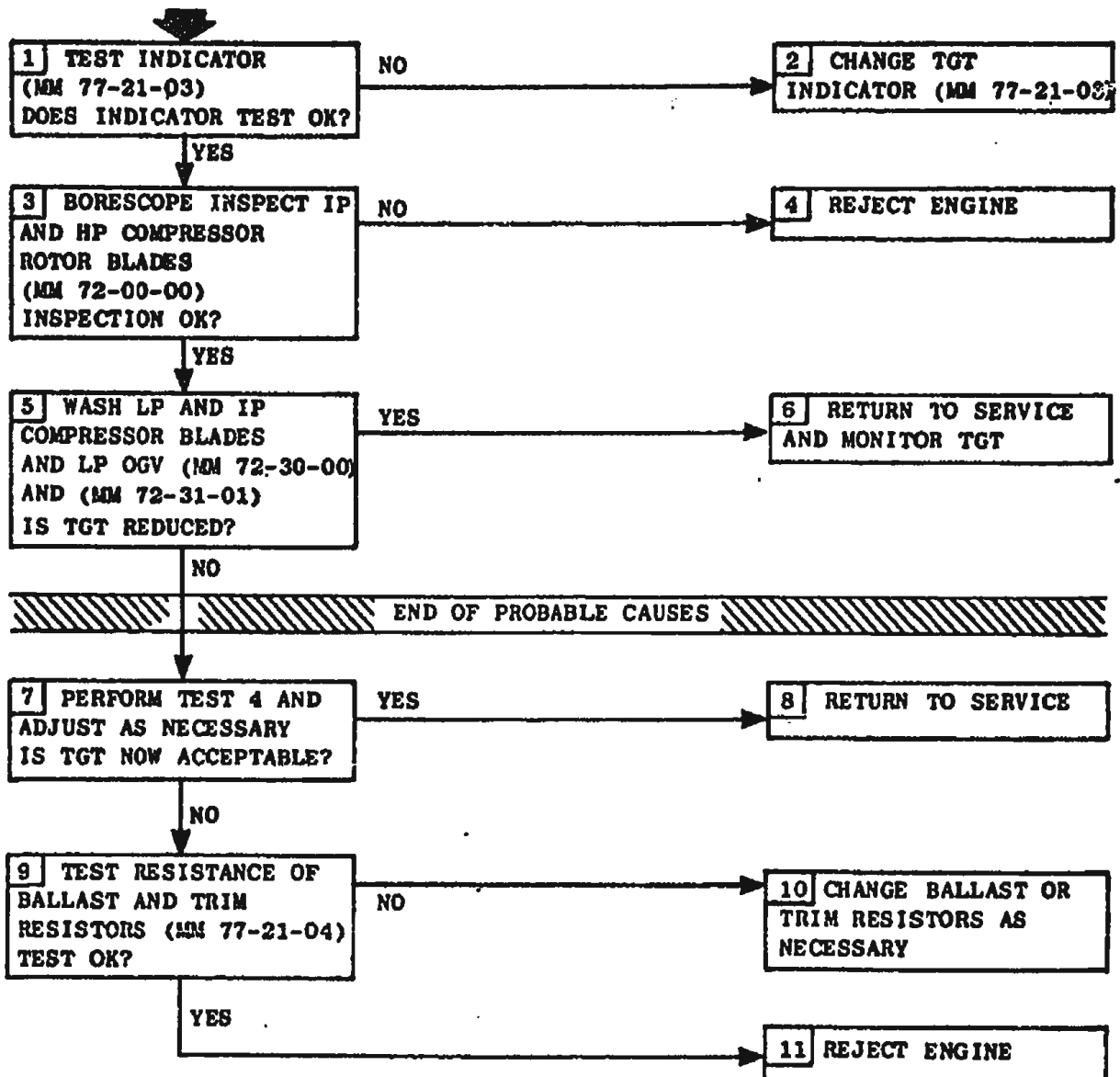
1G

71-80-00
Page 117
Nov 15/87



RB.211 Propulsion System MAINTENANCE

LOW POWER - TGT LIMITED - OTHER PARAMETERS NORMAL



48840A

R
R

Low power - T.G.T. high - other parameters normal
Fig.106

EFFECTIVITY: ALL

71-80-00
Page 118
May 15/85

050B

1G



RB.211 Propulsion System

MAINTENANCE

Notes referred to during fault isolation procedures:

1. If on unit removal the fuel system is found to be contaminated by metal or other foreign debris, the fuel filter in the H.P. fuel tube to fuel spray nozzle manifold must be replaced (Ref. 73-11-09, Removal Installation) within 750 hours.

Engine rundown with possible flame-out or
No response to throttle lever movement
Fig.107 (Sheet 1 of 2)

R EFFECTIVITY: ALL
R
050B

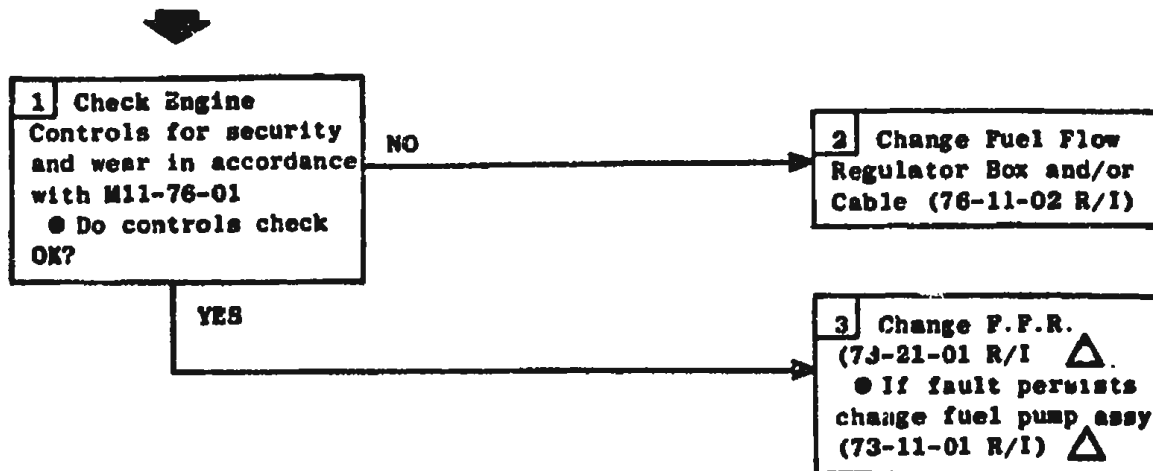
1G

71-80-00
Page 119
May 15/85



RB.211 Propulsion System MAINTENANCE

Engine run down to flight idle
or
Sub-idle hanging with possible flame-out
or
No response to throttle lever movement



△ See note 1. on Sheet 1

44712A

C
C
C

Engine run down with possible flame-out or
No response to throttle lever movement
Fig.107 (Sheet 2 of 2)

R
R
050B

EFFECTIVITY: ALL

1G

71-80-00
Page 120
Jul 15/83



RB.211 Propulsion System

MAINTENANCE

Notes referred to during fault isolation procedures:

1. If on unit removal the fuel system is found to be contaminated by metal or other foreign debris the fuel filter in the H.P. fuel tube to fuel spray nozzle manifold must be replaced (Ref.73-11-09 Removal/Installation) within 750 hours.

**Engine flame-out
Fig.108 (Sheet 1 of 3)**

R
R
050B

EFFECTIVITY: ALL

1G

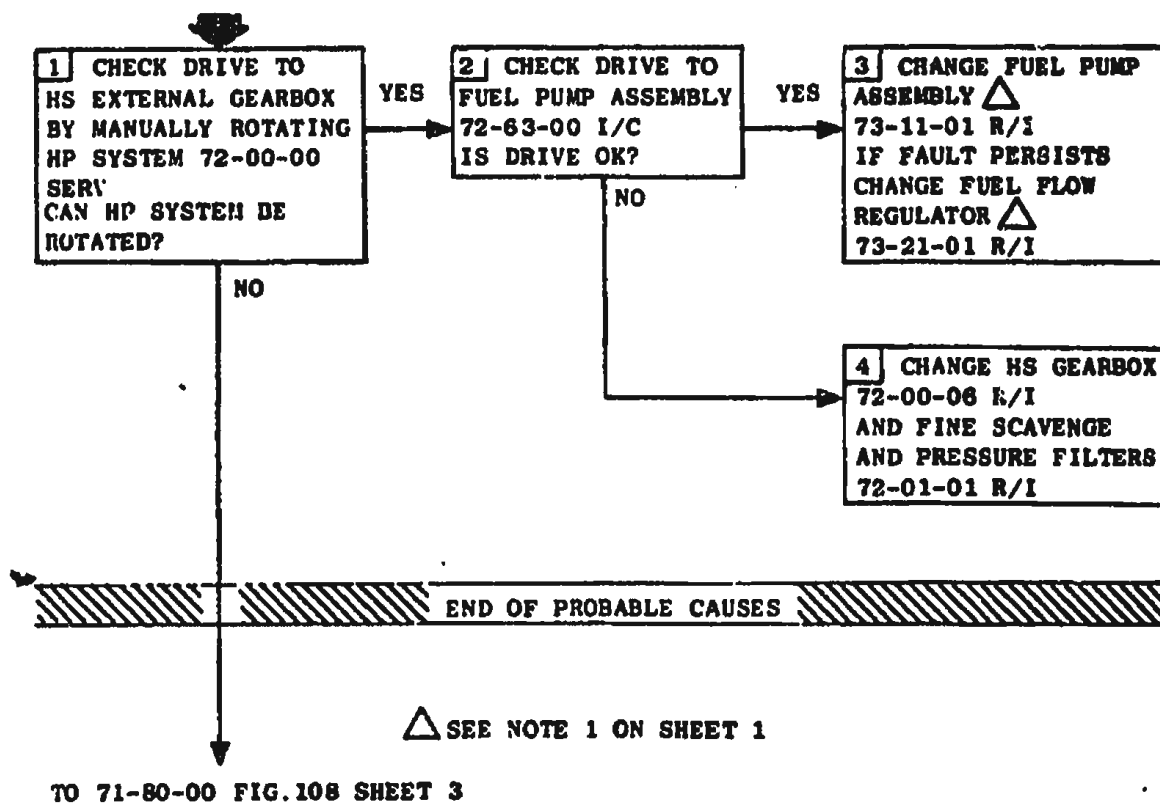
71-80-00
Page 121
May 15/85



RB.211 Propulsion System

MAINTENANCE

ENGINE FLAME OUT



48633

Engine flame-out
Fig.108 (Sheet 2 of 3)

R
R
050B

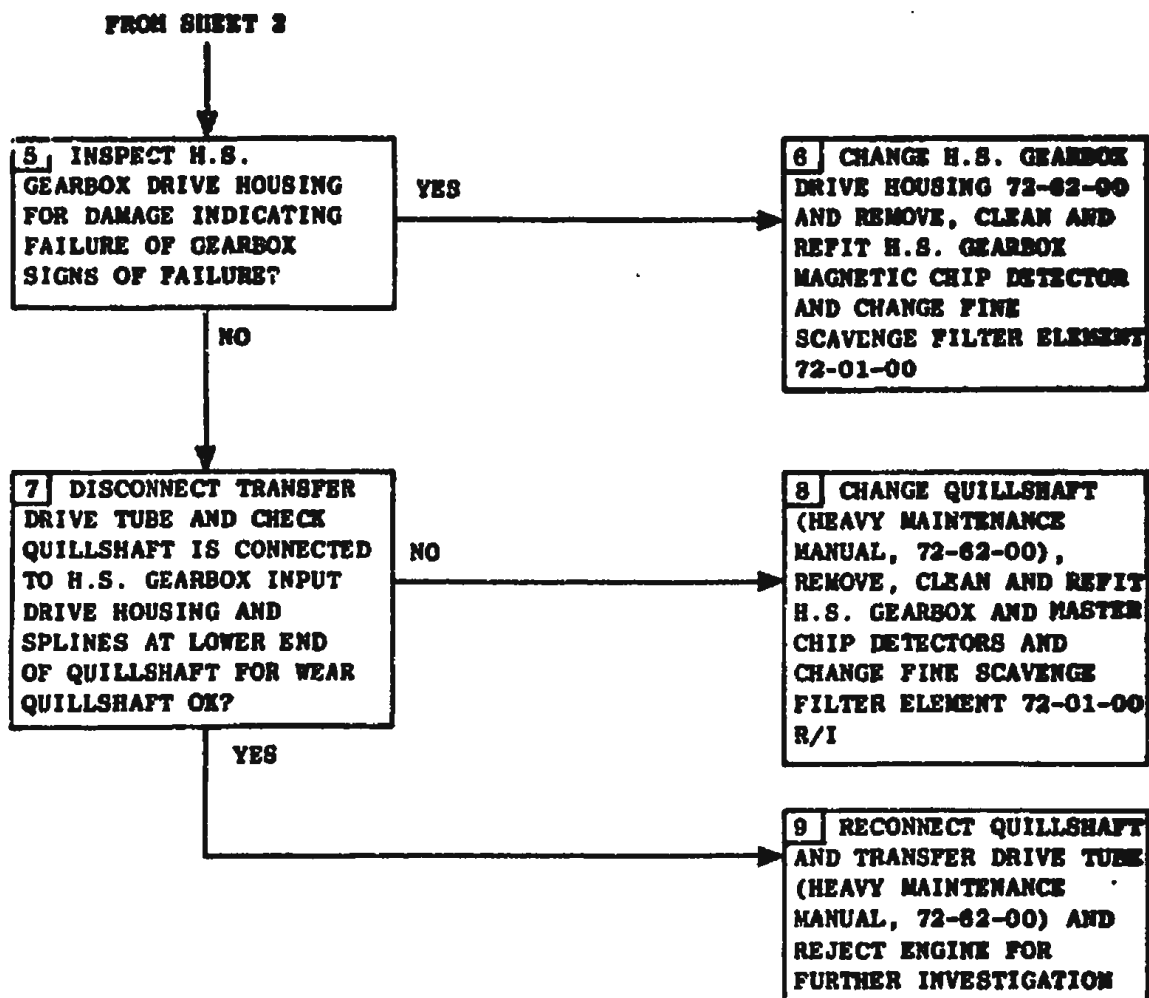
EFFECTIVITY: ALL

1G

71-80-00
Page 122
Jul 15/83



RB.211 Propulsion System MAINTENANCE



48635

Engine flame-out
Fig.108 (Sheet 3 of 3)

R
R
050B

EFFECTIVITY: ALL

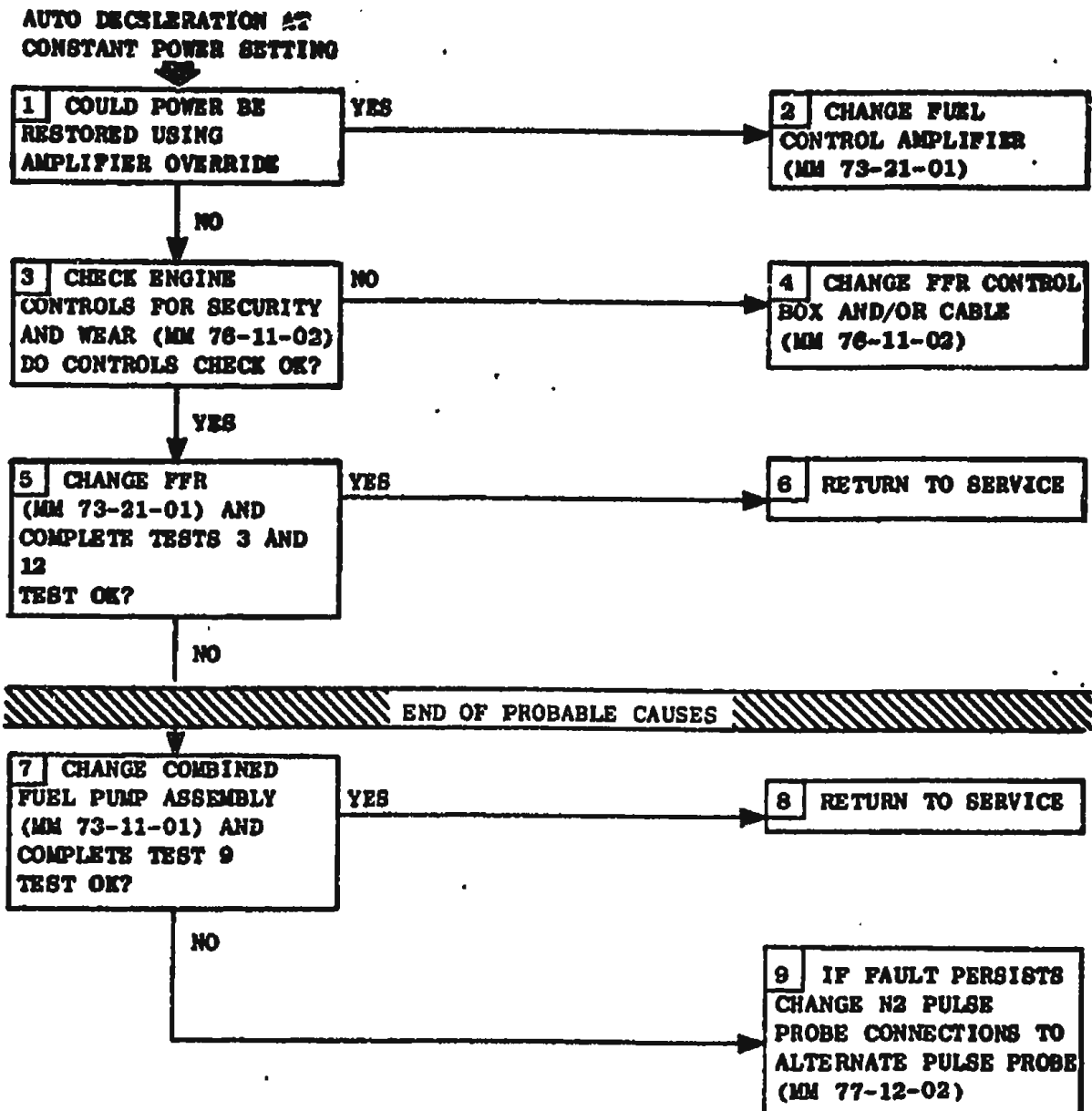
16

71-80-00
Page 123
May 15/85



RB.211 Propulsion System

MAINTENANCE



57577

Auto-deceleration at constant power setting
Fig.109

R
R
050B

EFFECTIVITY: ALL

16

71-80-00

Page 124
Mar 15/91



RB.211 Propulsion System

MAINTENANCE

HIGH POWER - FAULT ISOLATION

1. General

The diagrams and schematics in this section can be used for fault isolation any time a fault is reported or suspected. Uncommon abbreviations are defined on the fault code diagram or schematic.

- R If the flight crew reports a fault using a fault code number, the code number can be found in the Fault Isolation Reference Table in the Chapter 71 Fault Code Index. The index specifies the exact maintenance manual section, fault isolation diagram, and block number on the diagram where the fault isolation procedure should start. Where applicable, schematics are included at the end of the section to supplement the fault code diagrams or as an aid in isolating a problem not covered on the diagrams.

Refer to the Maintenance Manual Introduction for a more detailed discussion of the Fault Isolation Reporting Method (FIRM) and use of fault isolation diagrams/schematics.

2. Fault Isolation/Identification

Table 101 lists the fault isolation diagrams and schematics in this section.

TABLE 101

FIGURE	TITLE
103	High indicated E.P.R. - all other parameters normal
104	High power - all other indications high

EFFECTIVITY: ALL

050B

1A

71-81-00
Page 101
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

<u>COMPONENT</u>	<u>QTY</u>	<u>ACCESS/AREA</u>	<u>REFERENCE</u>
CONNECTOR - MULTIPLE	3	ENGINE: 412,422,432	77-11-04
INDICATOR - E.P.R.	3	PILOTS MAIN INST PANEL 210	77-11-02
REGULATOR - FUEL FLOW	3	ENGINE: 413A,423A,433AL	73-21-01
RESISTOR - TRIMMER E.P.R.	3	ENGINE: 414A,424A,434AR	77-11-14
RESISTOR - 8000 OHM E.P.R.	3	ENGINE: 414A,424A,434AR	77-11-14
TRANSMITTER - I.E.P.R.	3	ENGINE: 414A,424A,434AR	77-11-01

Component Location Index
Fig.101

R EFFECTIVITY: ALL

R
0508

1A

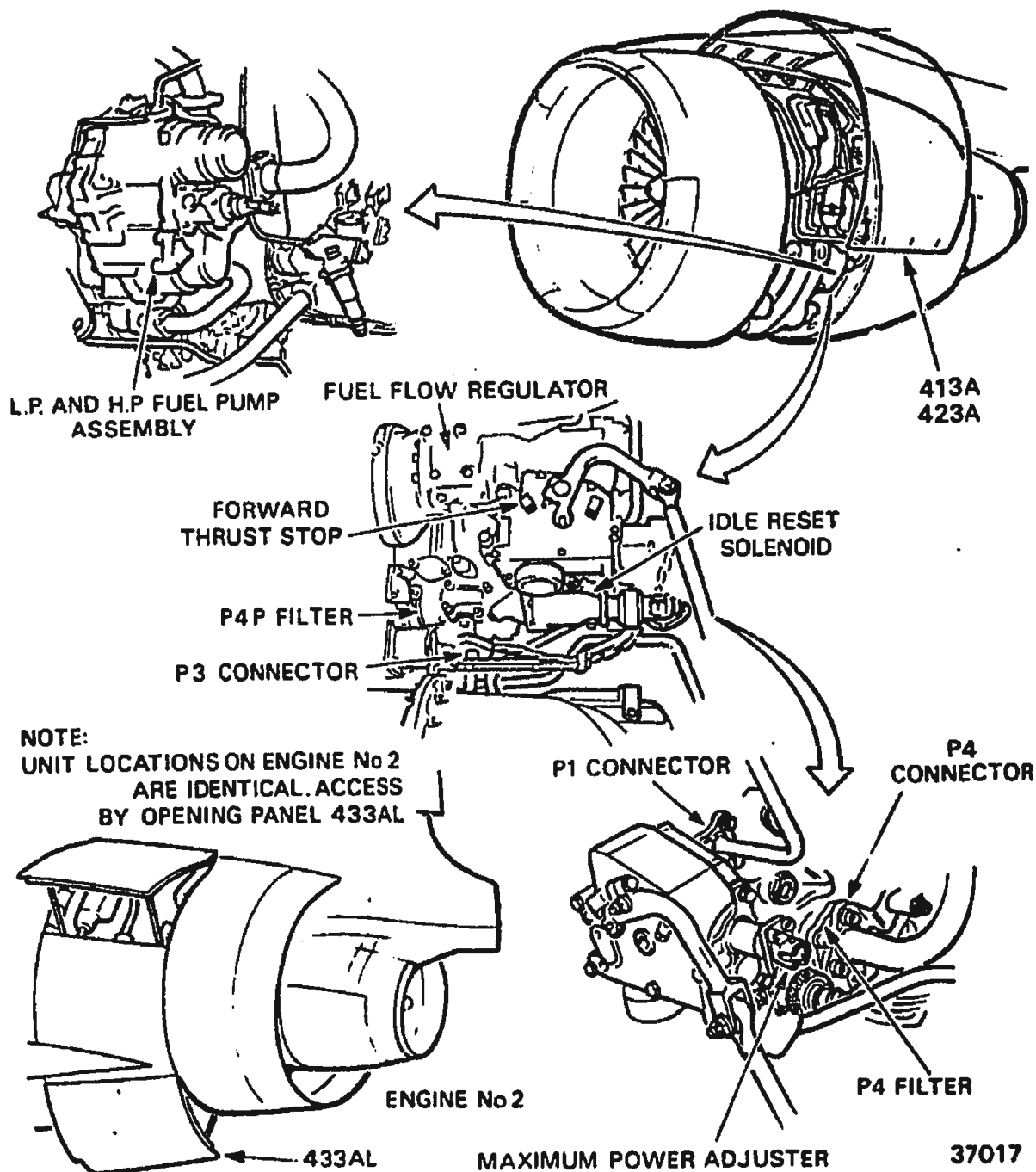
71-81-00

Page 102
Nov 15/87



BB.211 Propulsion System

MAINTENANCE

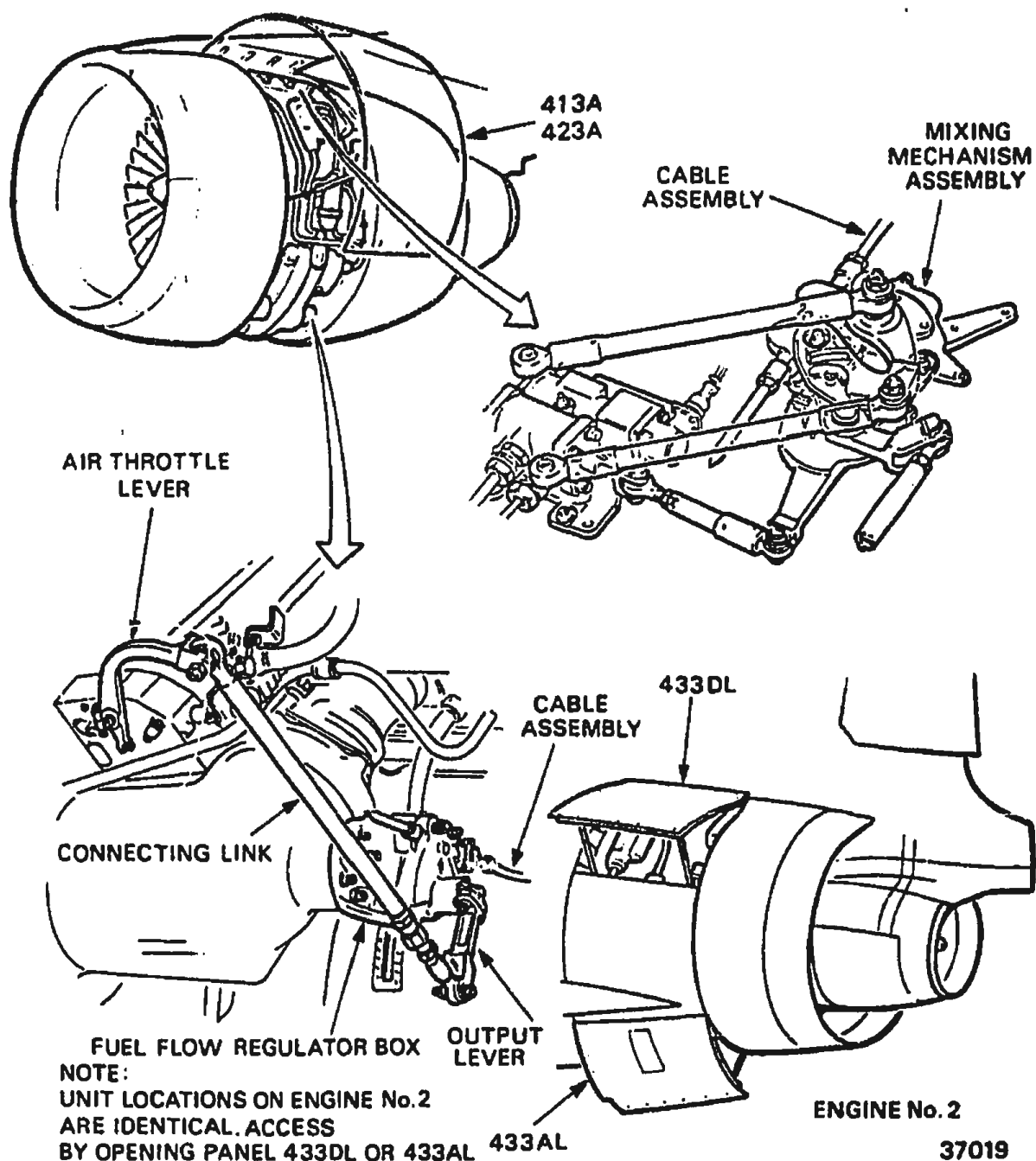


Component Locator Diagram
Fig.102 (Sheet 1 of 4)



RB.211 Propulsion System

MAINTENANCE



Component Locator Diagram
Fig. 102 (Sheet 2 of 4)

R
R
0508

EFFECTIVITY: ALL

1A

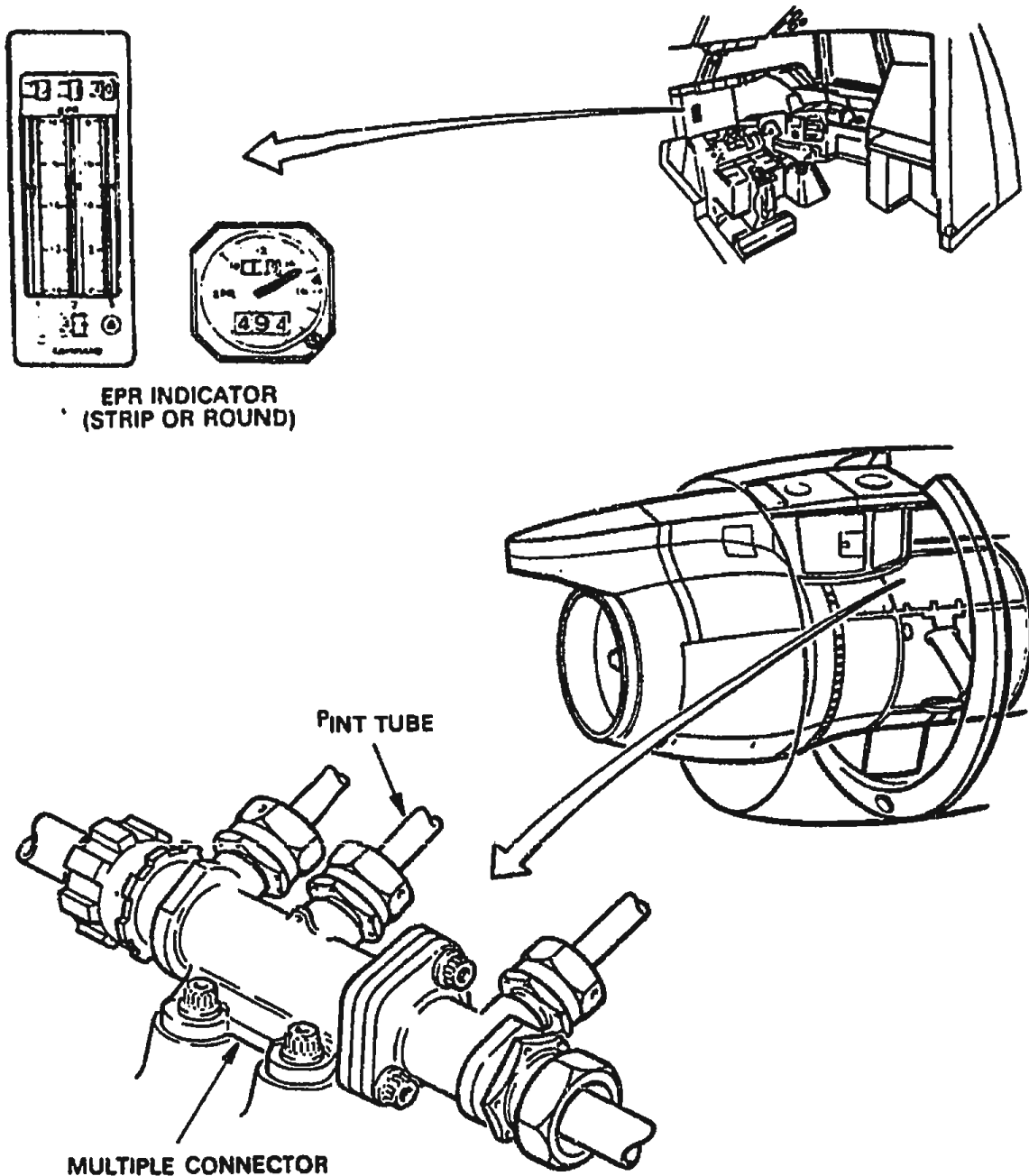
71-81-00

Page 104
Feb 15/82



RB.211 Propulsion System

MAINTENANCE



37024

Component Locator Diagram
Fig.102 (Sheet 3 of 4)

R
R
050B

EFFECTIVITY: ALL

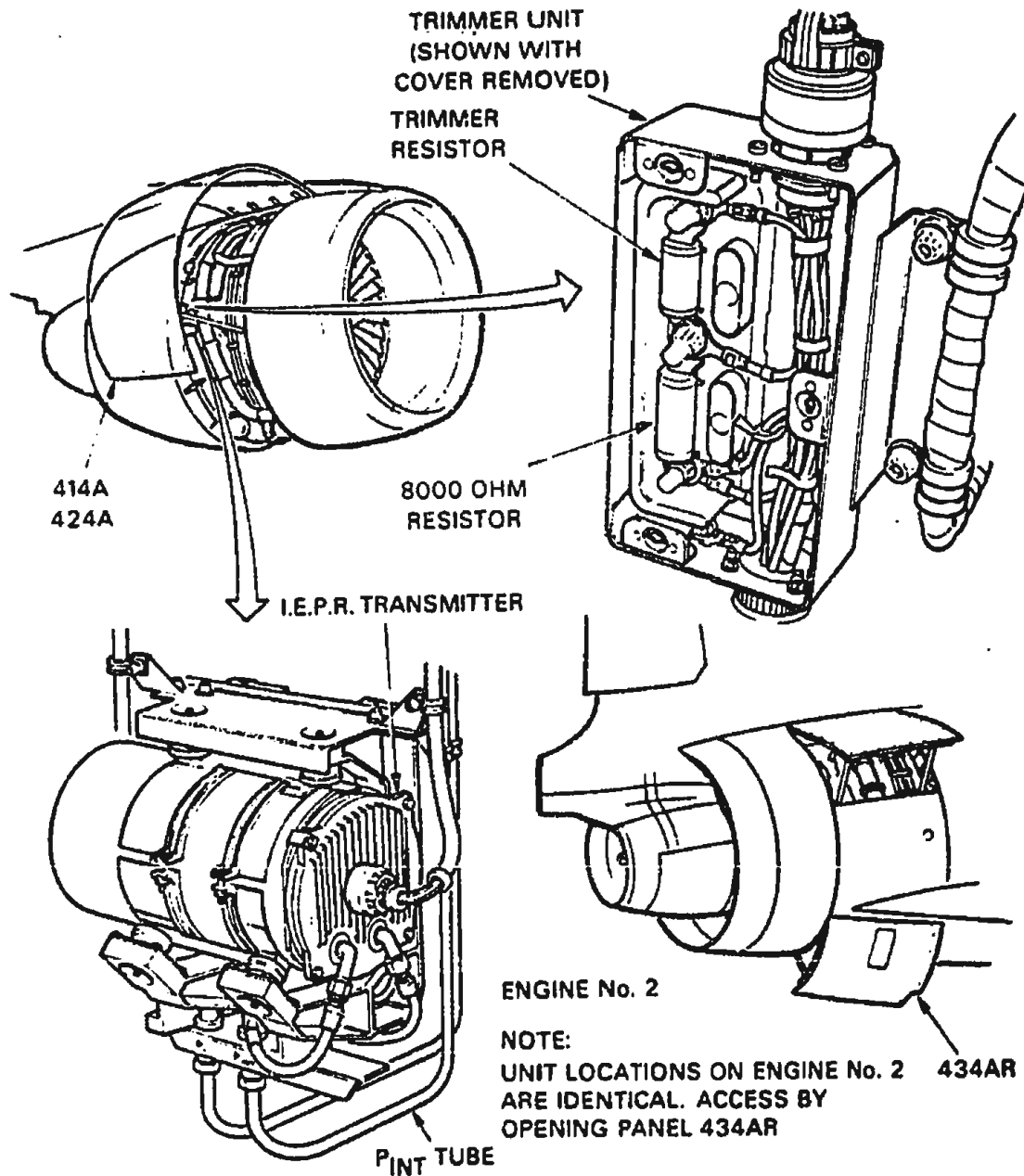
1A

71-81-00
Page 105
Feb 15/82



RB.211 Propulsion System

MAINTENANCE



37025

Component Locator Diagram
Fig.102 (Sheet 4 of 4)

R
R
050B

EFFECTIVITY: ALL

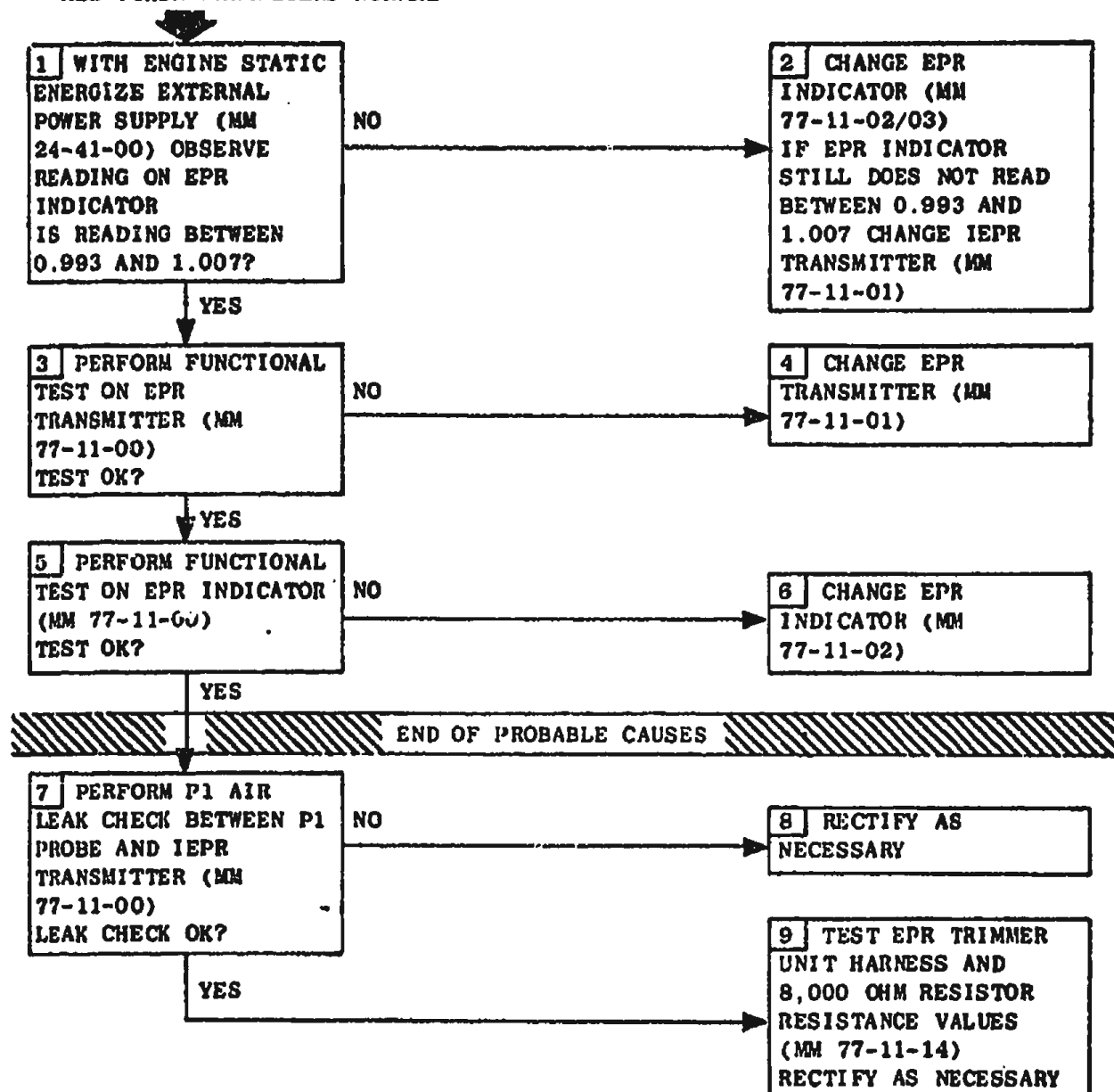
1A

71-81-00
Page 106
Feb 15/82



RB.211 Propulsion System MAINTENANCE

HIGH INDICATED EPR
- ALL OTHER PARAMETERS NORMAL



79730

R
R

High indicated E.P.R. - all other parameters normal
Fig.103

EFFECTIVITY: ALL

050B

1A

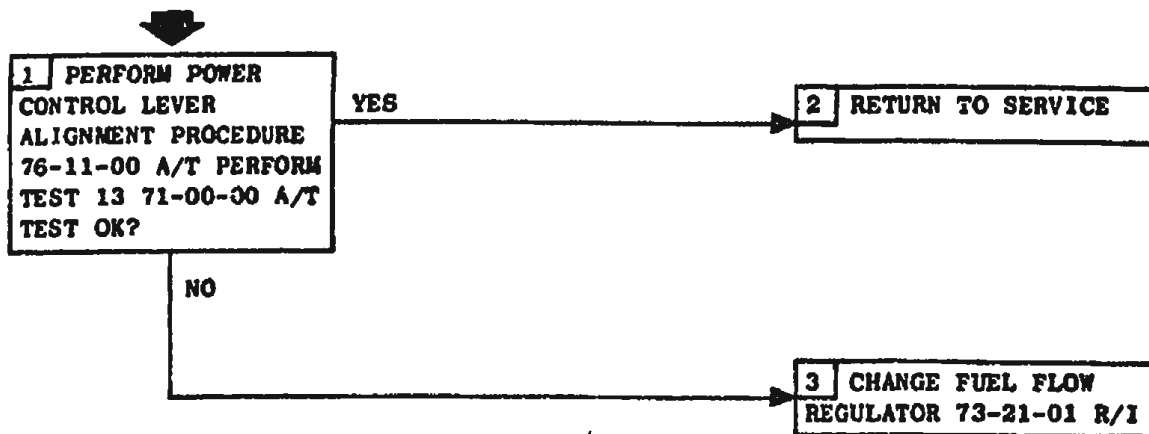
71-81-00
Page 107
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

HIGH POWER - ALL OTHER INDICATIONS HIGH



50012

High power - all other indications high
Fig.104

R EFFECTIVITY: ALL
R
050B 1A

71-81-00
Page 108
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

FLUCTUATING POWER - FAULT ISOLATION

1. General

The diagrams and schematics in this section can be used for fault isolation any time a fault is reported or suspected. Uncommon abbreviations are defined on the using fault code diagram or schematic.

If the flight crew reports a trouble using a fault code number, the code number can be found in the Fault Isolation Reference Table in the Chapter 71 Fault Code Index. The index specifies the exact maintenance manual section, fault isolation diagram, and block number on the diagram where the fault isolation procedure should start. Where applicable, schematics are included at the end of the section to supplement the fault code diagrams or as an aid in isolating a problem not covered on the diagrams.

Refer to the Maintenance Manual Introduction for a more detailed discussion of the Fault Isolation Reporting Method (FIRM) and use of fault isolation diagrams/schematics.

2. Fault Isolation/Identification

Table 101 lists the fault isolation diagrams and schematics in this section.

TABLE 101

FIGURE	TITLE
103	Fluctuating power (all parameters) at constant throttle setting
104	E.P.R. indication fluctuates - all other indications normal
105	Engine oscillates with or without fluctuating parameters (pod nod)



RB.211 Propulsion System

MAINTENANCE

<u>COMPONENT</u>	<u>QTY</u>	<u>ACCESS/AREA</u>	<u>REFERENCE</u>
AMPLIFIER - SPEED AND TEMPERATURE CONTROL	3	ENGINE: 412, 422, 432	73-21-02
INDICATOR - E.P.R.	3	PILOTS MAIN INST PANEL 210	77-11-02
RAM - V.I.G.V.	3	ENGINE: 412, 422, 432	75-31-01
MASTER REGULATOR - FUEL FLOW	3	ENGINE: 412, 422, 432	73-21-01
TRANSMITTER - I.E.P.R.	3	ENGINE: 412, 422, 432	77-11-01

Component Location Index
Fig.101

R EFFECTIVITY: ALL
R
050B

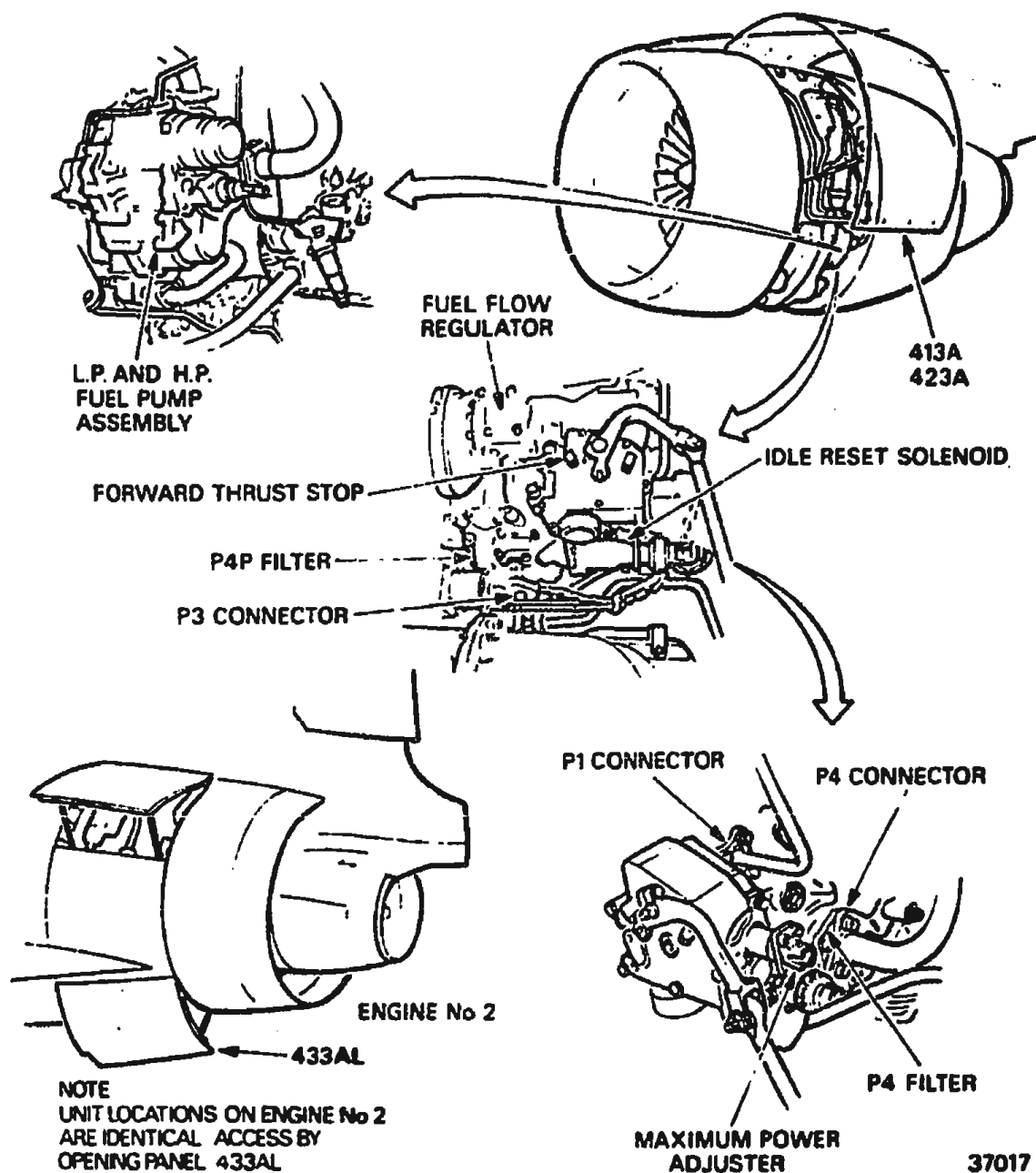
16

71-82-00
Page 102
Mar 15/91



RB.211 Propulsion System

MAINTENANCE



37017

Component Locator Diagram
Fig.102 (Sheet 1 of 4)

R
R
050B

EFFECTIVITY: ALL

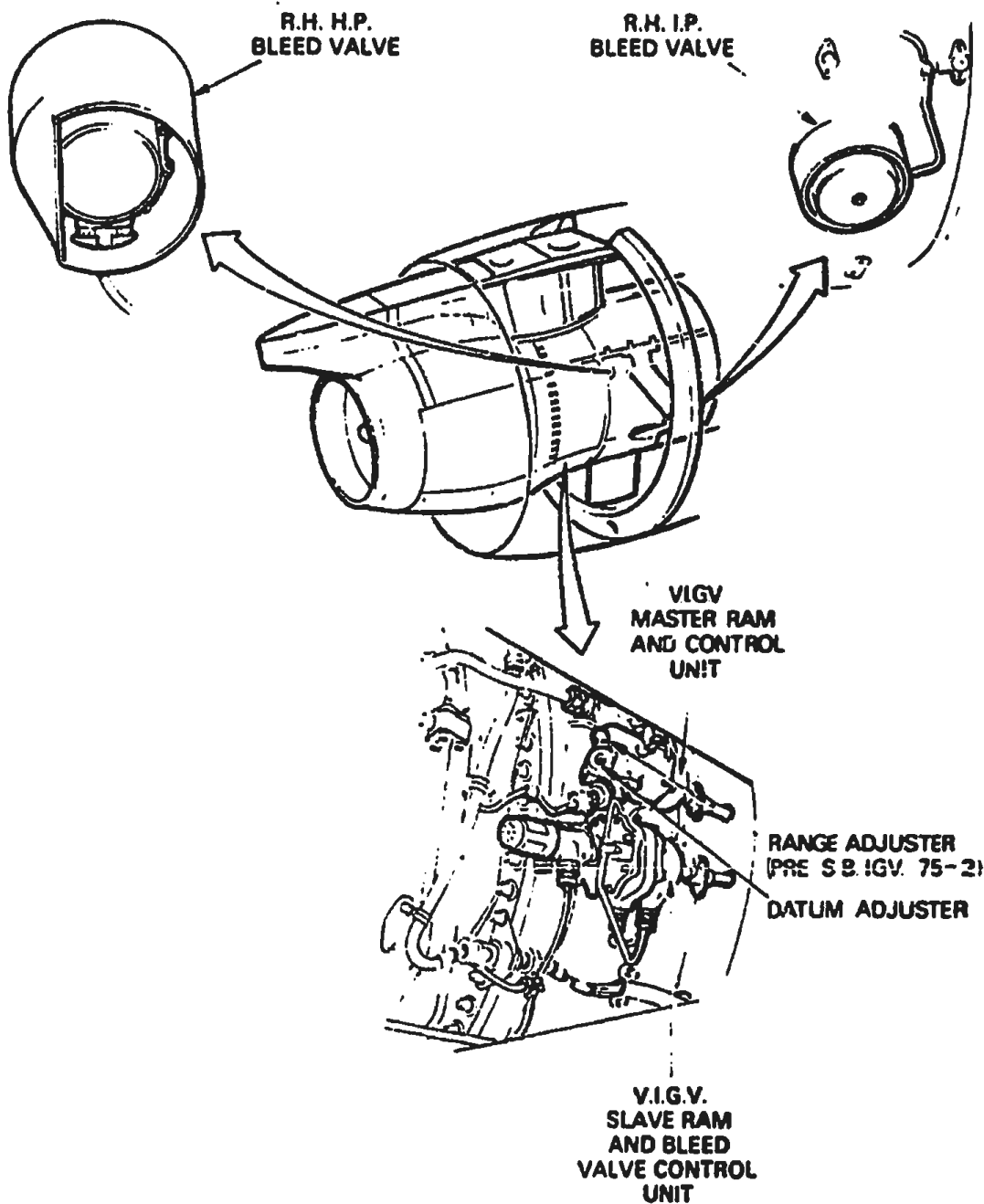
1A

71-82-00
Page 103
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



37022

Component Locator Diagram
Fig.102 (Sheet 2 of 4)

R
R
0508

EFFECTIVITY: ALL

1A

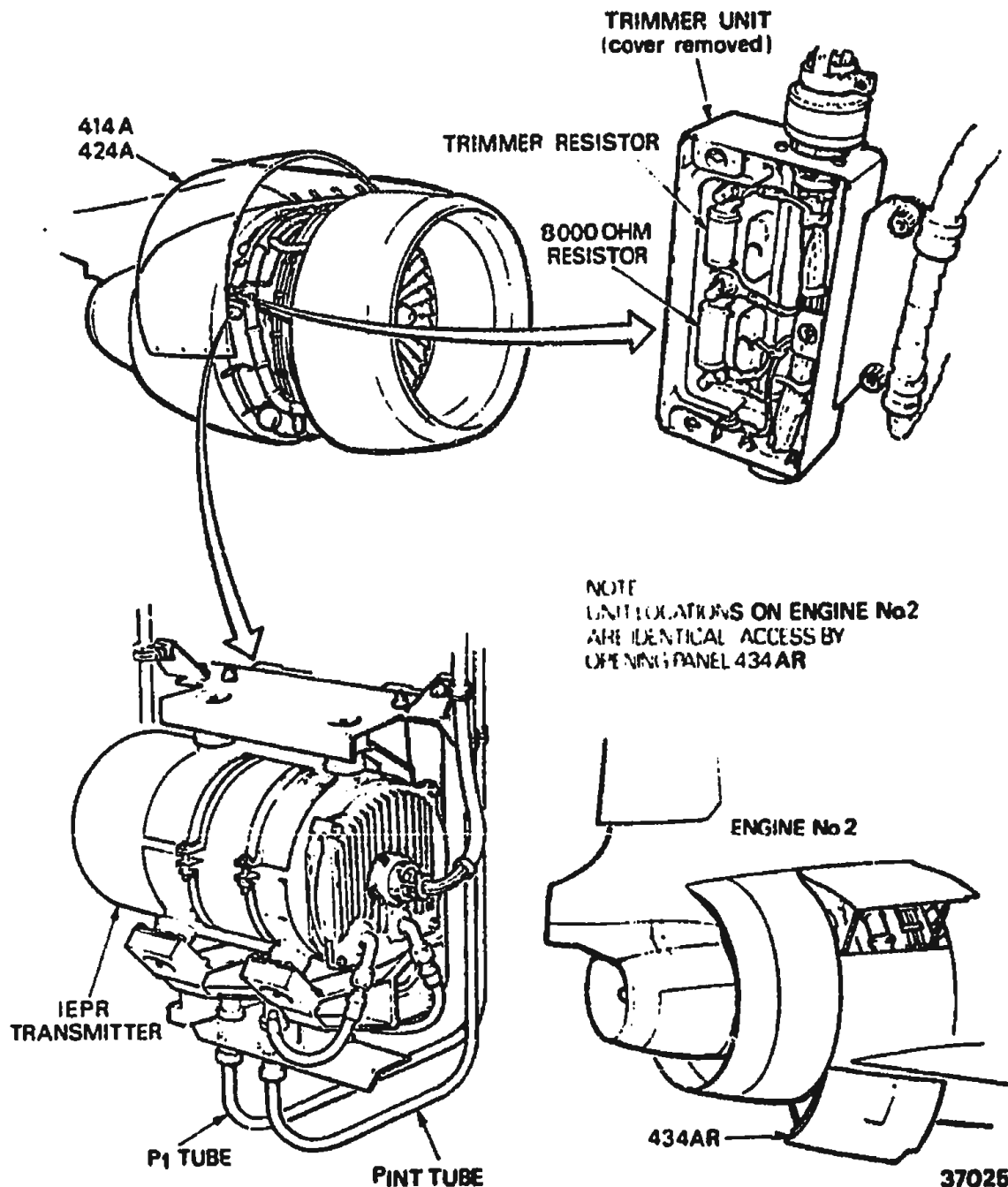
71-82-00

Page 104
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



Component Locator Diagram
Fig.102 (Sheet 3 of 4)

R
R
050B

EFFECTIVITY: ALL

1A

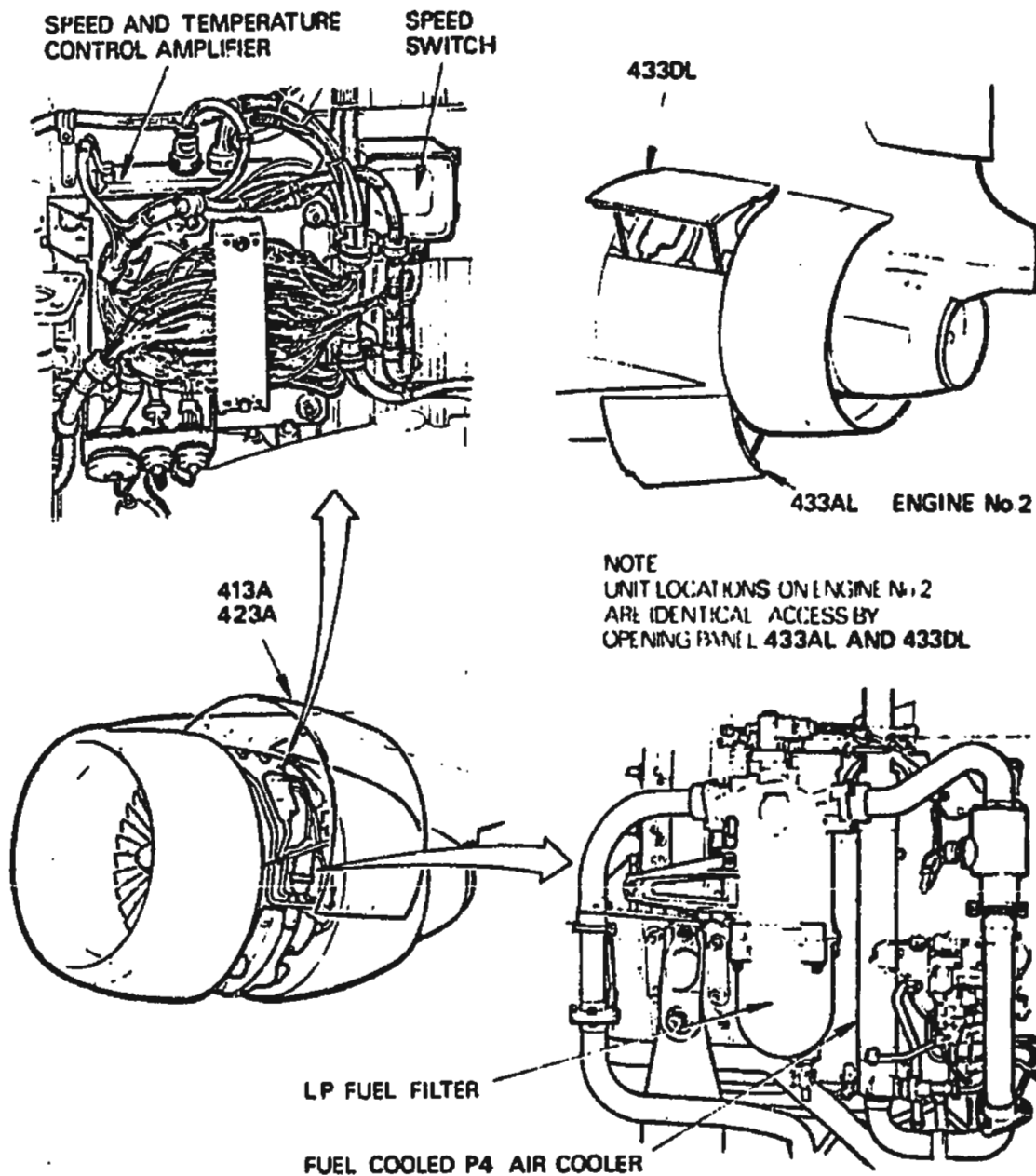
71-82-00

Page 105
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



37016

Component Locator Diagram
Fig.102 (Sheet 4 of 4)

R
R
0508

EFFECTIVITY: ALL

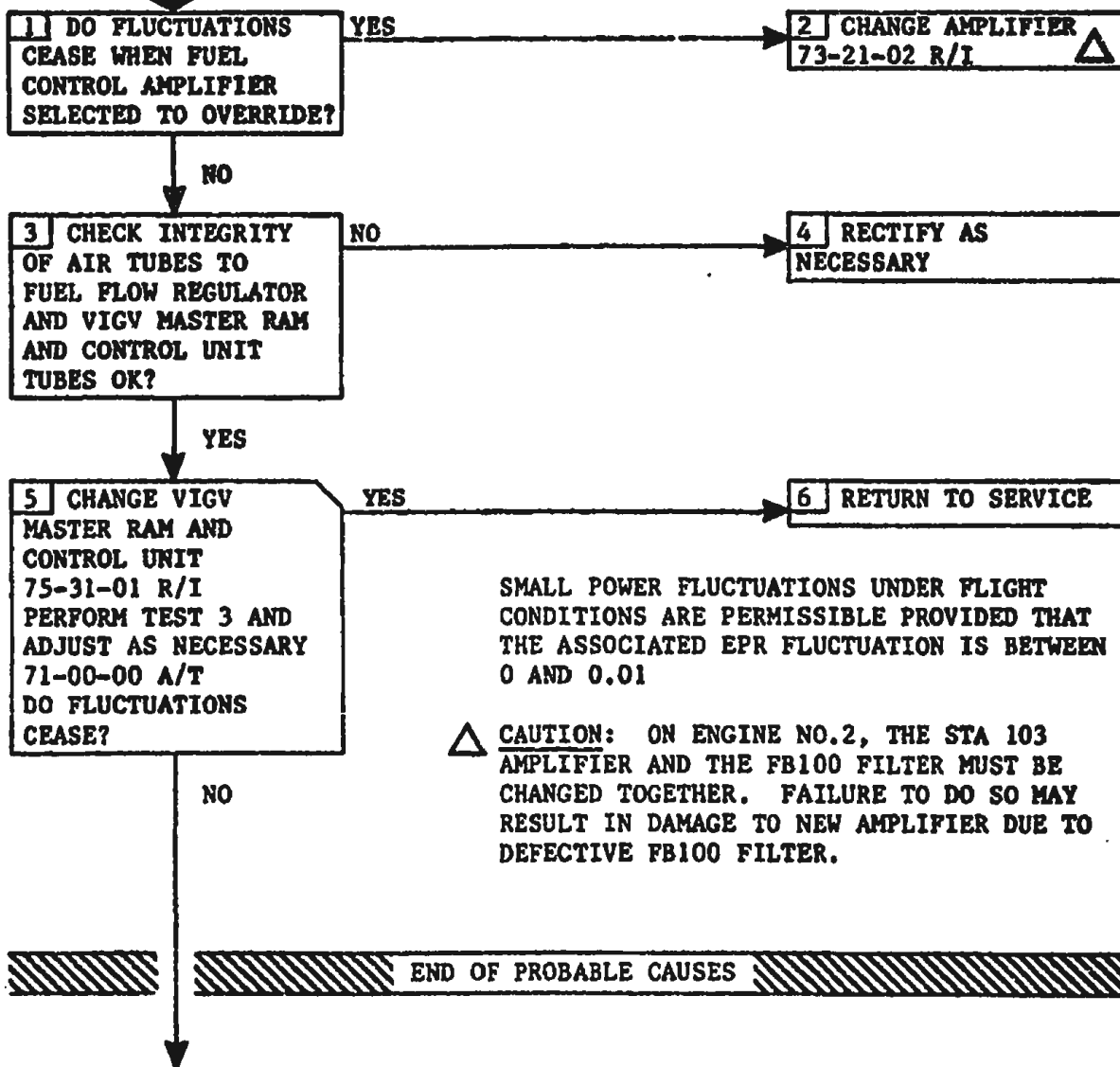
1A

71-82-00
Page 106
Nov 15/81



RB.211 Propulsion System MAINTENANCE

FLUCTUATING POWER - ALL PARAMETERS -
AT CONSTANT THROTTLE SETTING



TO 71-82-00 FIG.103 SHEET 2

50059A

CR Fluctuating power (all parameters) at constant throttle setting
CR Fig.103 (Sheet 1 of 2)

EFFECTIVITY: ALL

71-82-00

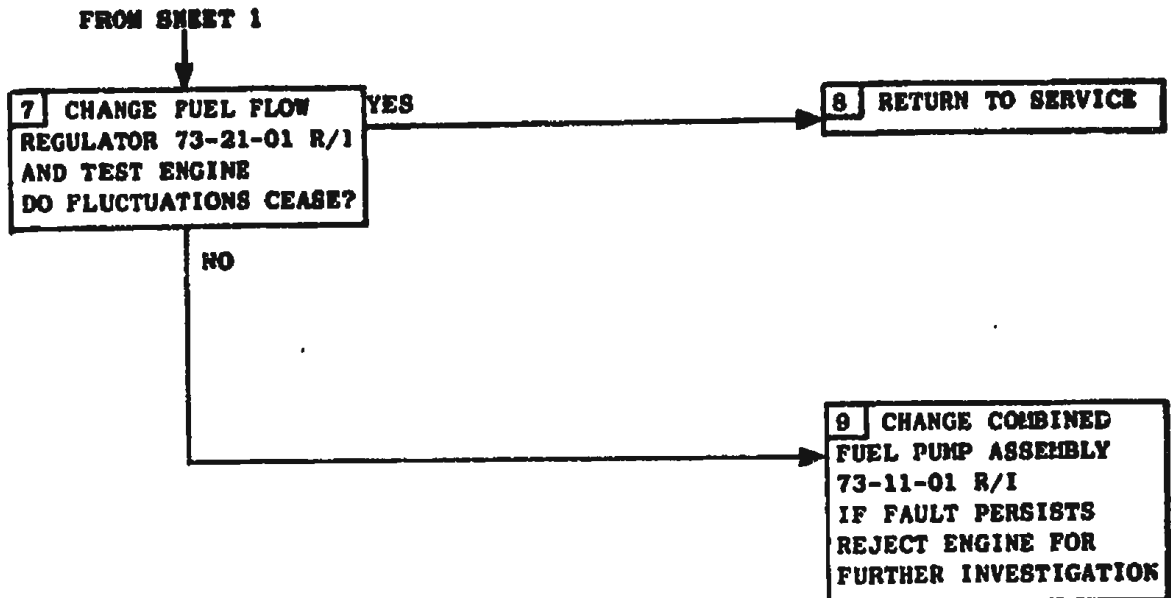
Page 107
Mar 15/91

050B

1G



RB.211 Propulsion System MAINTENANCE



50060

CR Fluctuating power (all parameters) at constant throttle setting
CR Fig.103 (Sheet 2 of 2)

EFFECTIVITY: ALL

050B

1G

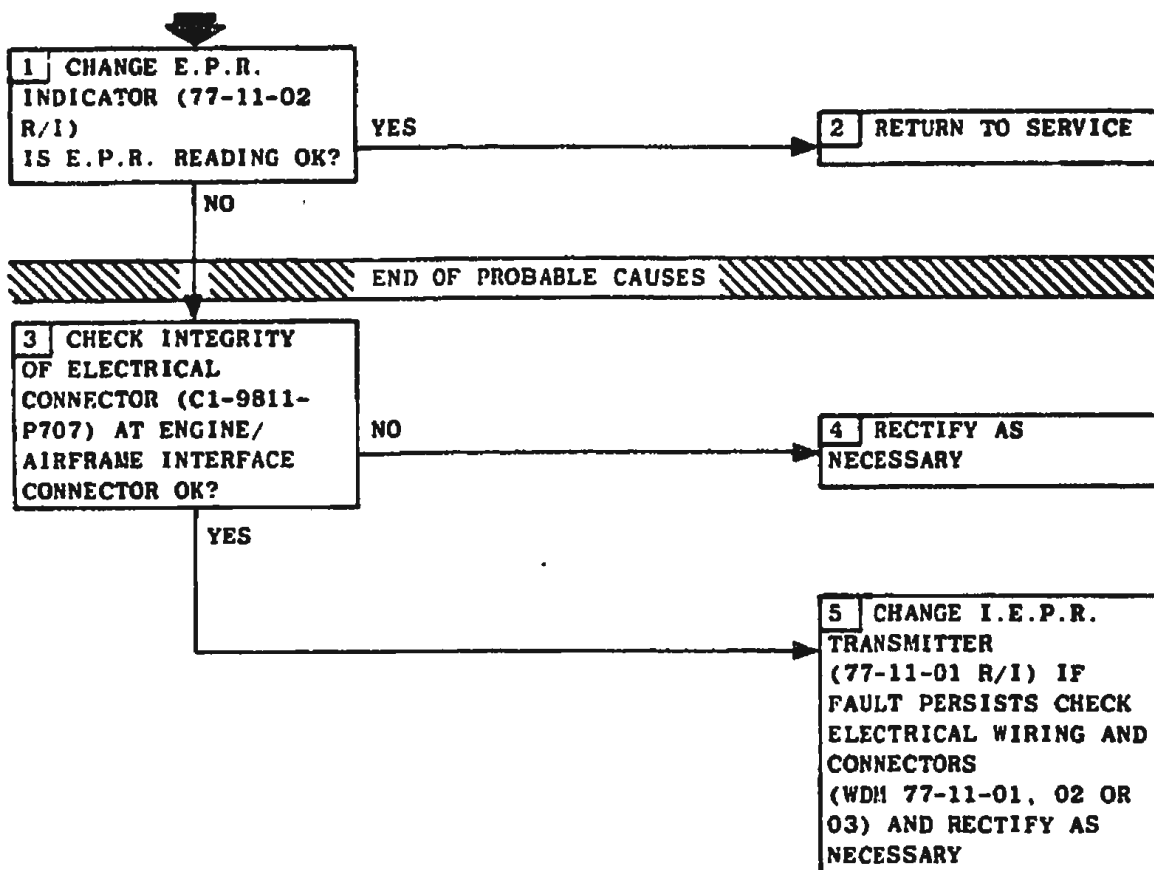
71-82-00
Page 108
May 15/82



RB.211 Propulsion System

MAINTENANCE

E.P.R. FLUCTUATES - ALL OTHER INDICATIONS NORMAL



48647

E.P.R. indication fluctuates - all other indications normal
Fig.104

R
R
050B

EFFECTIVITY: ALL

1G

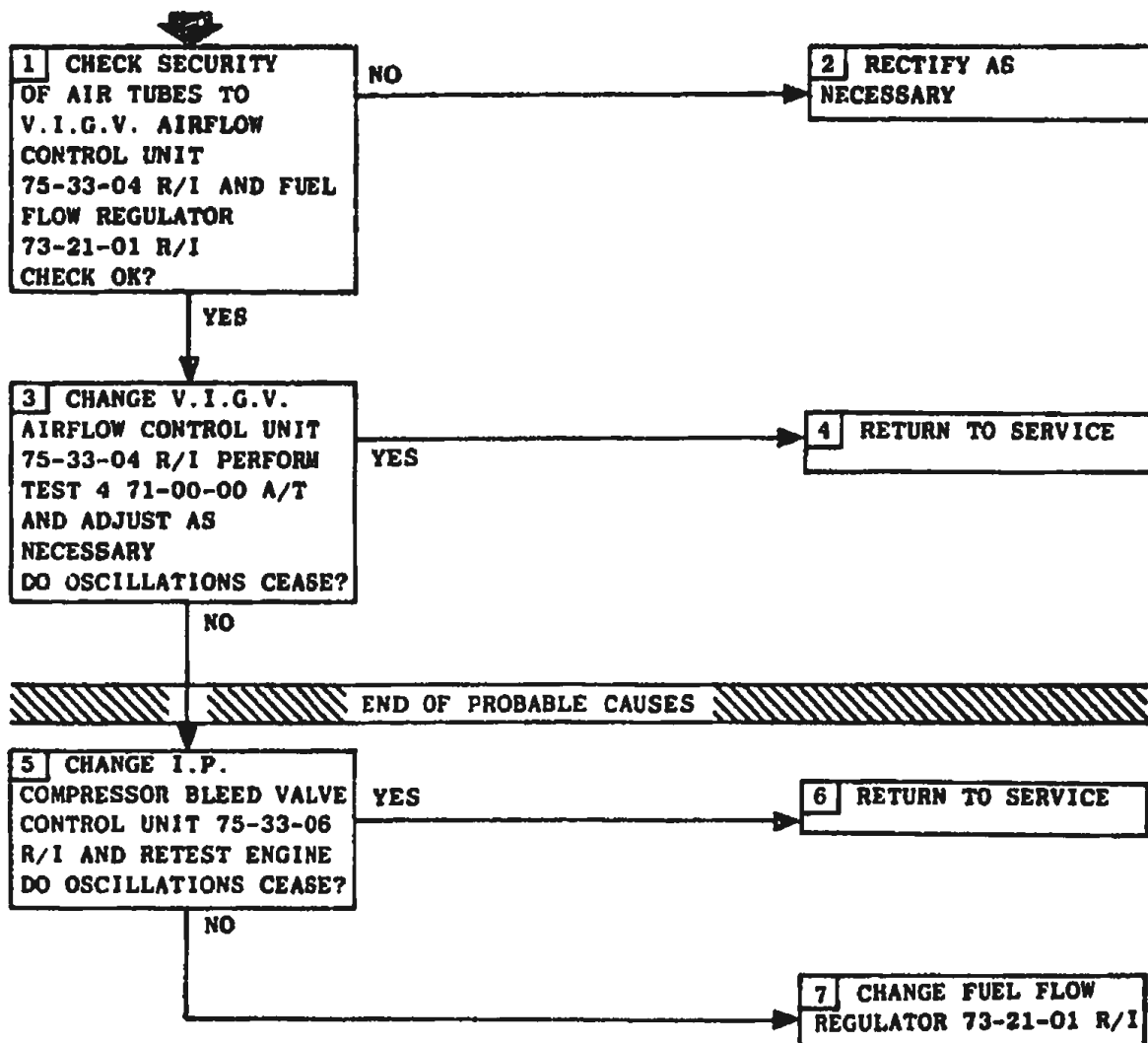
71-82-00
Page 109
Mar 15/83



RB.211 Propulsion System

MAINTENANCE

ENGINE OSCILLATES WITH OR WITHOUT
FLUCTUATING PARAMETERS (POD NOD)



48648

Engine oscillates with or without fluctuating
parameters (pod nod)
Fig.105

R
R
R

R
R

EFFECTIVITY: ALL

0508

16

71-82-00
Page 110
Mar 15/83



THROTTLE LEVER STAGGER - FAULT ISOLATION

1. General

The diagrams and schematics in this section can be used for fault isolation any time a fault is reported or suspected. Uncommon abbreviations are defined on the fault code diagram or schematic.

- R If the flight crew reports a fault using a fault code number, the code number can be found in the Fault Isolation Reference Table in the Chapter 71 Fault Code Index. The index specifies the exact maintenance manual section, fault isolation diagram, and block number on the diagram where the fault isolation procedure should start. Where applicable, schematics are included at the end of the section to supplement the fault code diagrams or as an aid in isolating a problem not covered on the diagrams.

Refer to the Maintenance Manual Introduction for a more detailed discussion of the Fault Isolation Reporting Method (FIRM) and use of fault isolation diagrams/schematics.

2. Fault Isolation/Identification

Table 101 lists the fault isolation diagrams and schematics in this section.

TABLE 101

FIGURE	TITLE
103	Throttle stagger owing to high E.P.R. reading - all other parameters normal
104	Throttle stagger owing to low E.P.R. reading - all other parameters normal
105	Throttle stagger - one throttle leads
106	Throttle stagger - one throttle lags



RB.211 Propulsion System

MAINTENANCE

<u>COMPONENT</u>	<u>QTY</u>	<u>ACCESS/AREA</u>	<u>REFERENCE</u>
BOX - FUEL FLOW			
REGULATOR CONTROL	3	ENGINE: 412,422,432	76-11-02
CONNECTOR - MULTIPLE	3	ENGINE: 412,422,432	77-11-04
INDICATOR - E.P.R.	3	PILOTS MAIN INST PANEL - 210	77-11-02
REGULATOR - FUEL FLOW	3	ENGINE: 412,422,432	73-21-01
RESISTOR - E.P.R.			
8000 OHM	3	ENGINE: 412,422,432	77-11-14
RESISTOR - E.P.R.			
TRIMMER	3	ENGINE: 412,422,432	77-11-14
TUBE - P8 RAKE	15	ENGINE: 412,422,432	72-51-03

Component Location Index
Fig.101

R
R
050B

EFFECTIVITY: ALL

1G

71-83-00
Page 102
Nov 15/87

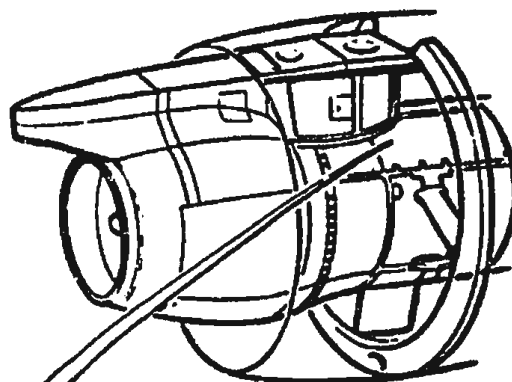
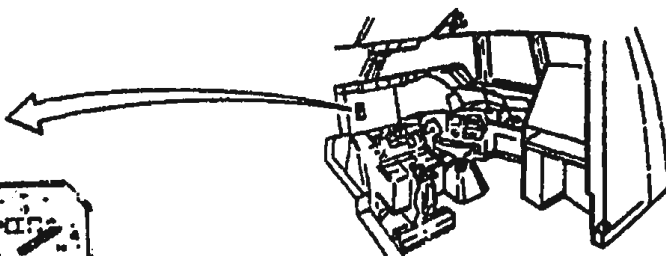


RB.211 Propulsion System

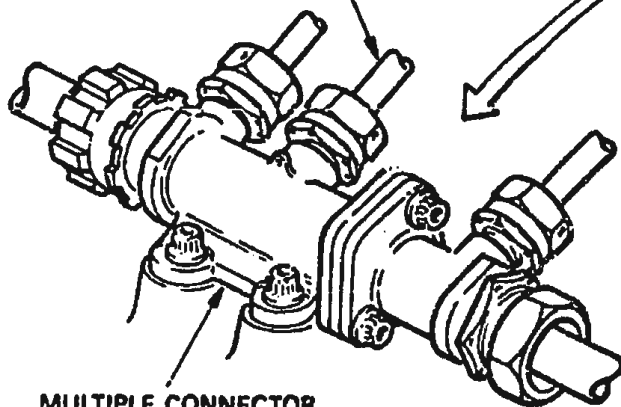
MAINTENANCE



EPR INDICATOR
(STRIP OR ROUND)



PINT TUBE



MULTIPLE CONNECTOR

37024

Component Locator Diagram
Fig.102 (Sheet 1 of 4)

R
R
050B

EFFECTIVITY: ALL

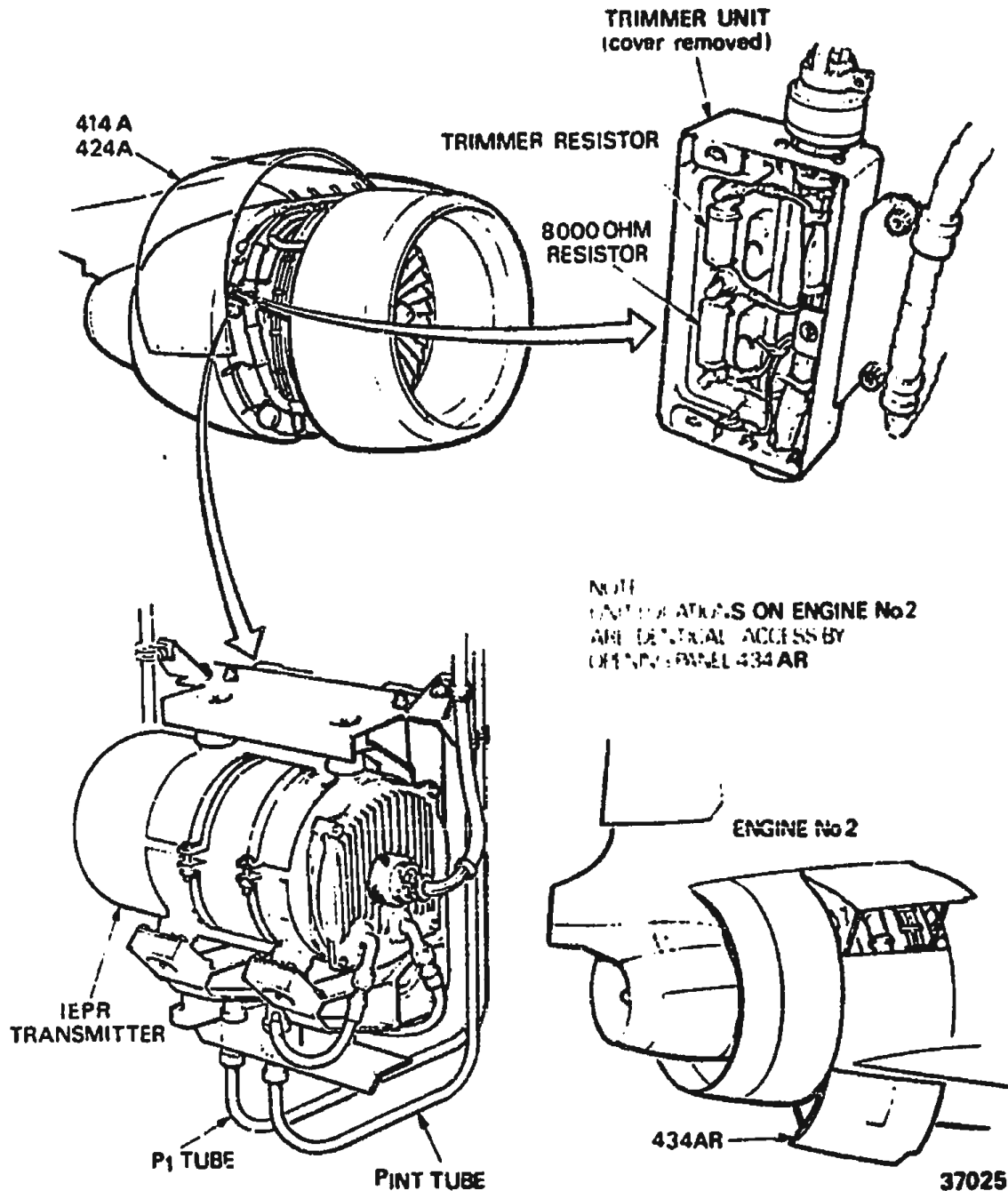
1T

71-83-00
Page 103
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



Component Locator Diagram
Fig.102 (Sheet 2 of 4)

R
R
0508

EFFECTIVITY: ALL

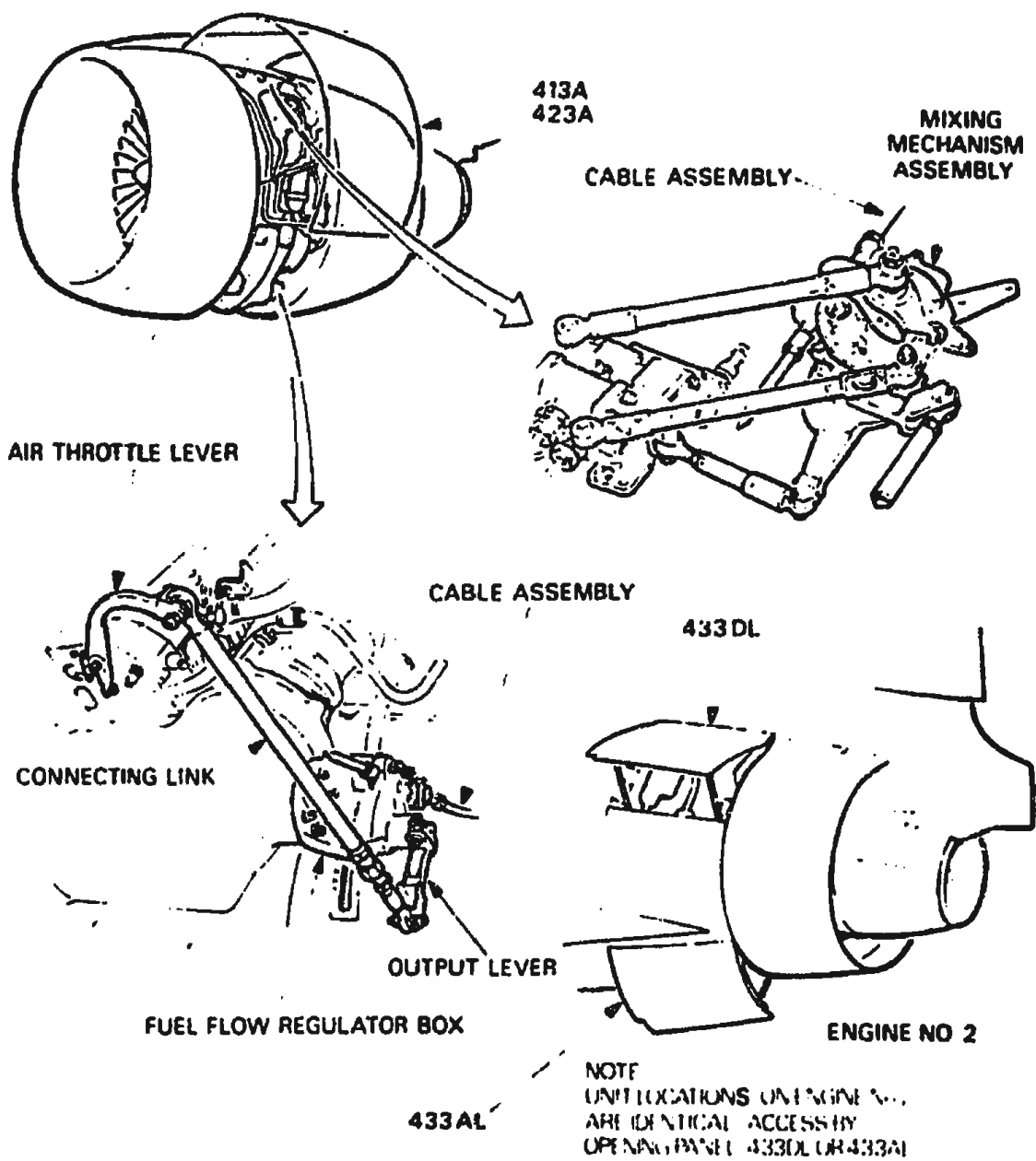
1T

71-83-00
Page 104
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



37019

Component Locator Diagram
Fig.102 (Sheet 3 of 4)

R
R
050B

EFFECTIVITY: ALL

1T

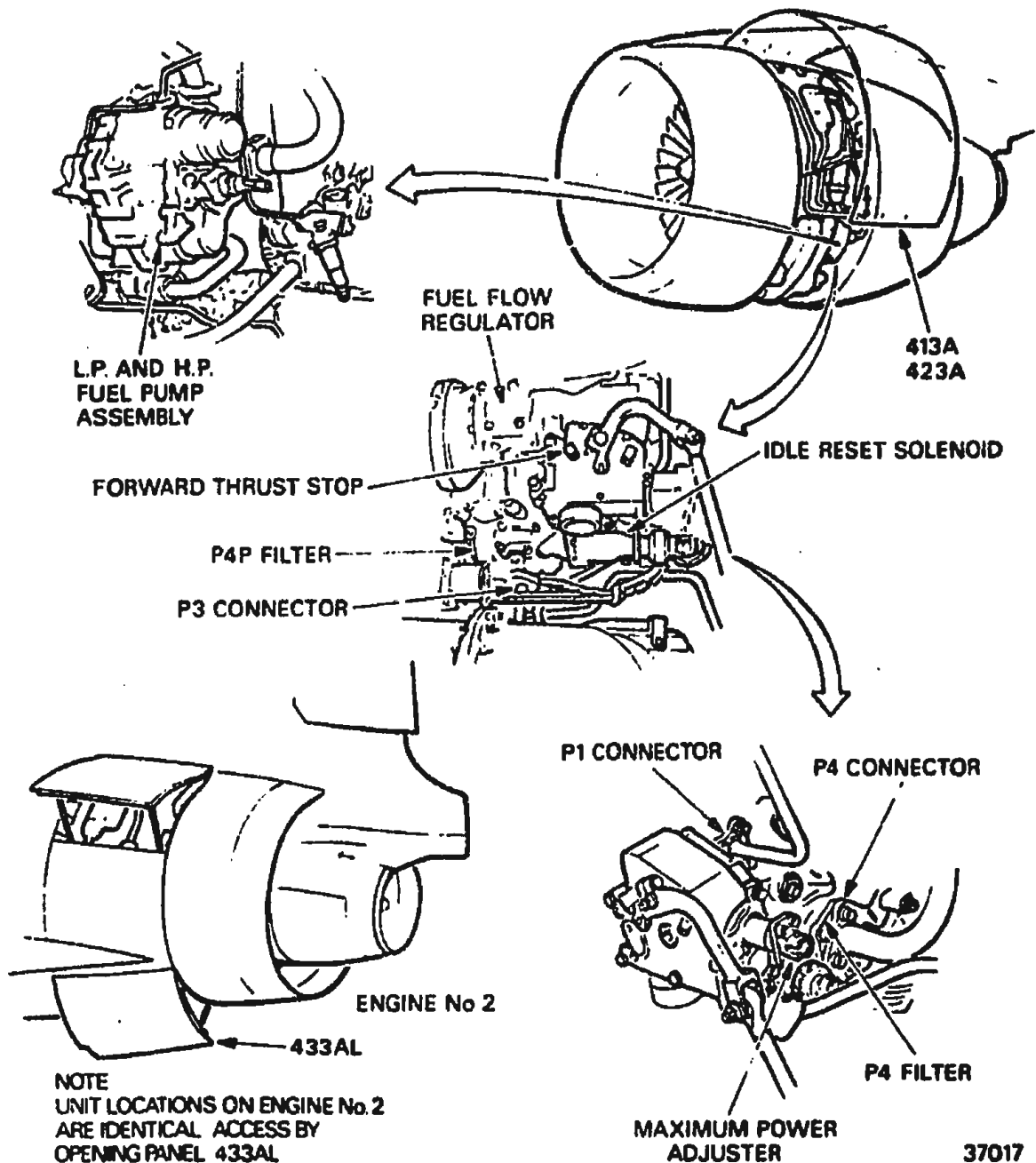
71-83-00

Page 105
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



Component Locator Diagram
Fig.102 (Sheet 4 of 4)

R
R
050B

EFFECTIVITY: ALL

1T

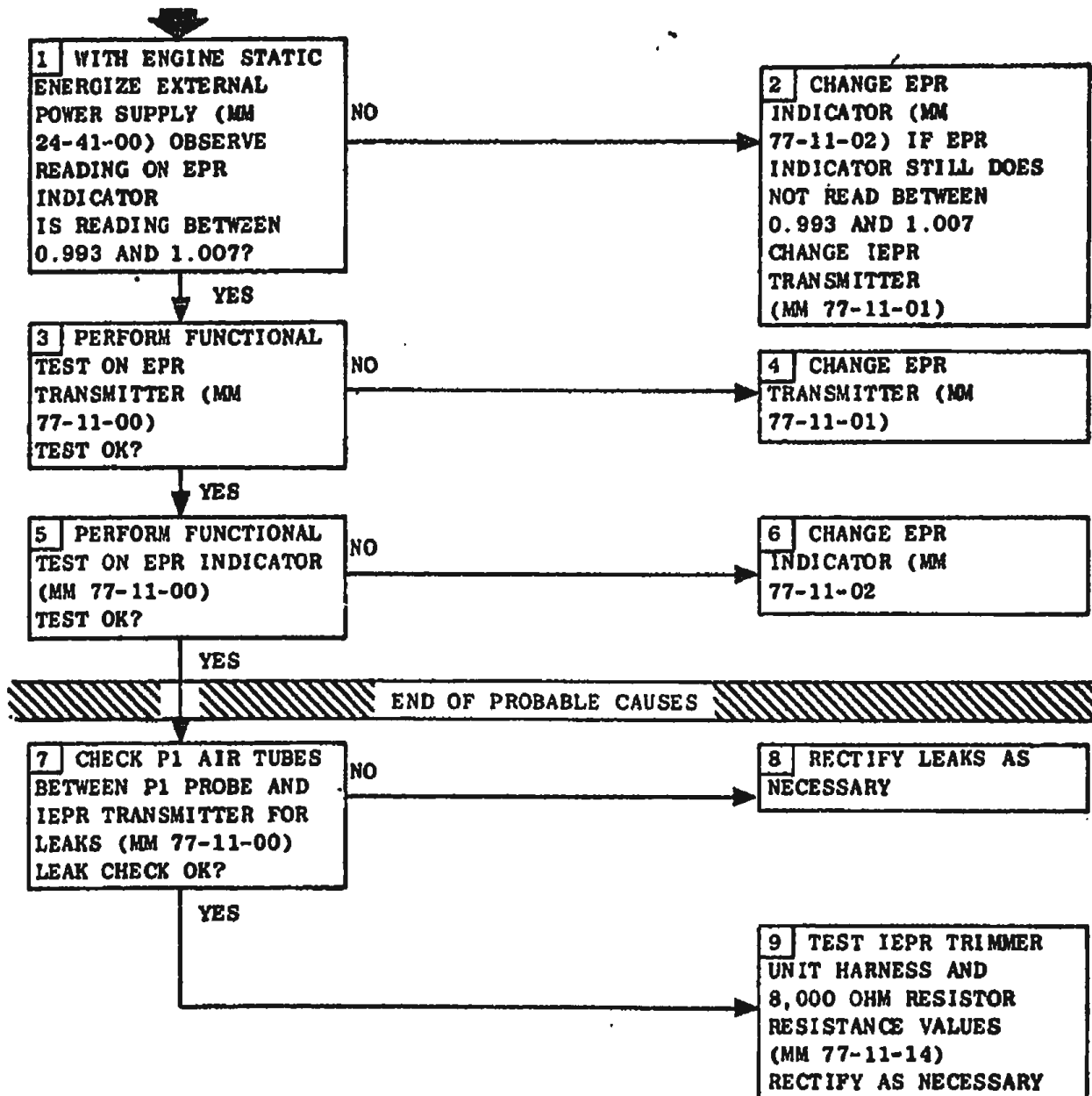
71-83-00
Page 106
Nov 15/81



RB.211 Propulsion System

MAINTENANCE

THROTTLE STAGGER OWING TO HIGH EPR READING
- ALL OTHER PARAMETERS NORMAL



48649A

R
R
R

Throttle stagger owing to high E.P.R. reading - all other parameters normal

Fig.103

EFFECTIVITY: ALL

0508

16

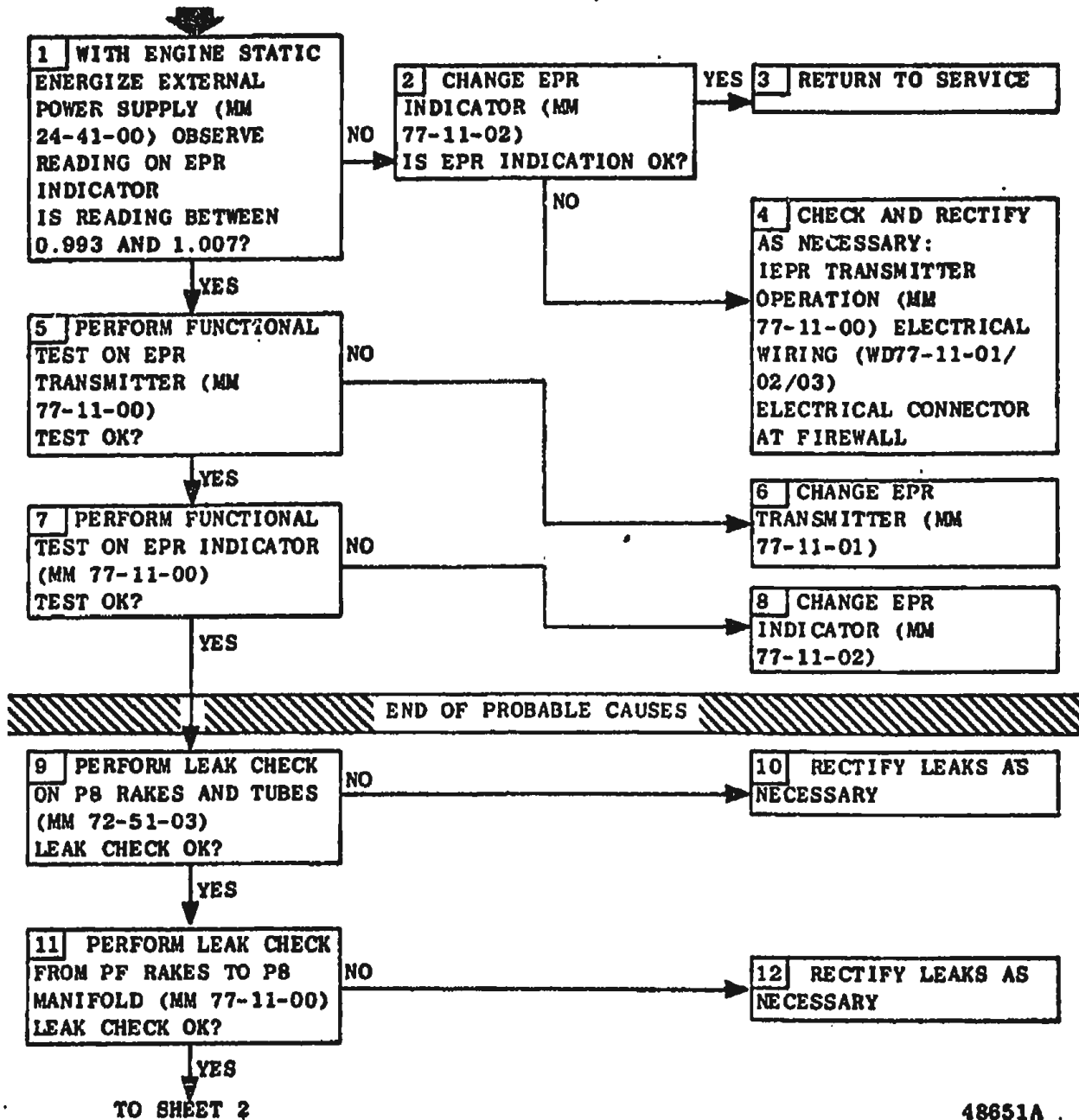
71-83-00

Page 107
Nov 15/87



RB.211 Propulsion System MAINTENANCE

THROTTLE STAGGER OWING TO LOW EPR READING
- ALL OTHER PARAMETERS NORMAL



48651A

R
R
R

Throttle stagger owing to low E.P.R. reading - all other
parameters normal
Fig.104 (Sheet 1 of 2)

EFFECTIVITY: ALL

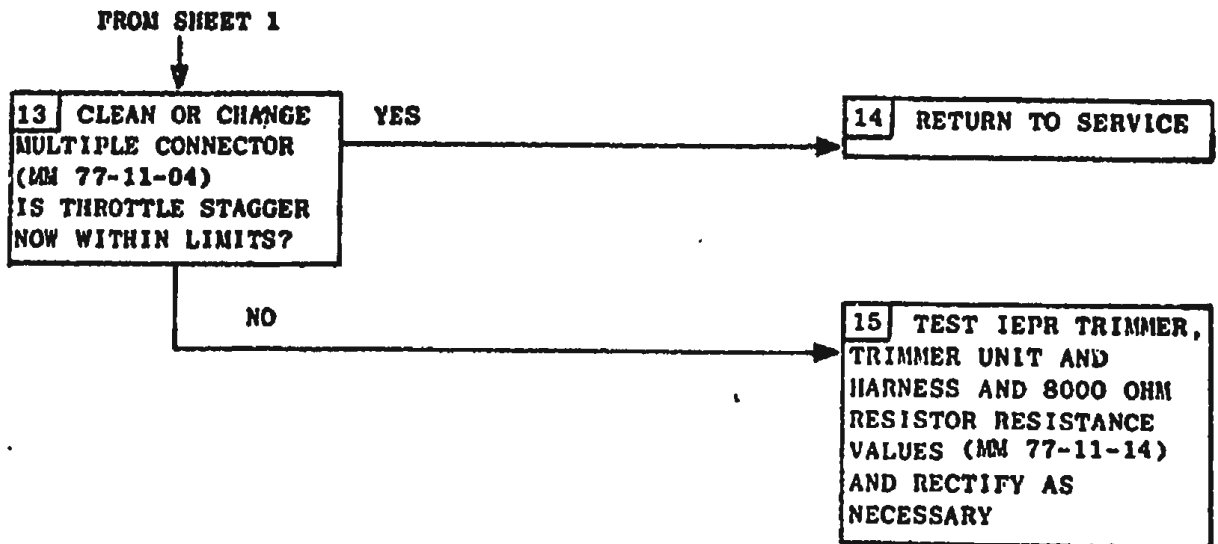
050B

16

71-83-00
Page 108
Nov 15/87



RB.211 Propulsion System MAINTENANCE



48652A

R
R
R

Throttle stagger owing to low E.P.R. reading - all other
parameters normal
Fig.104 (Sheet 2 of 2)

EFFECTIVITY: ALL

050B

1G

71-83-00
Page 109
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

Notes referred to during fault isolation procedures:

1. If on unit removal the fuel system is found to be contaminated by metal or other foreign debris, the fuel filter in the H.P. fuel tube to fuel spray nozzle manifold must be replaced (Ref. 73-11-09 Removal/Installation) within 750 hours.

Throttle stagger - one throttle leads
Fig.105 (Sheet 1 of 2)

R
R
050B

EFFECTIVITY: ALL

16

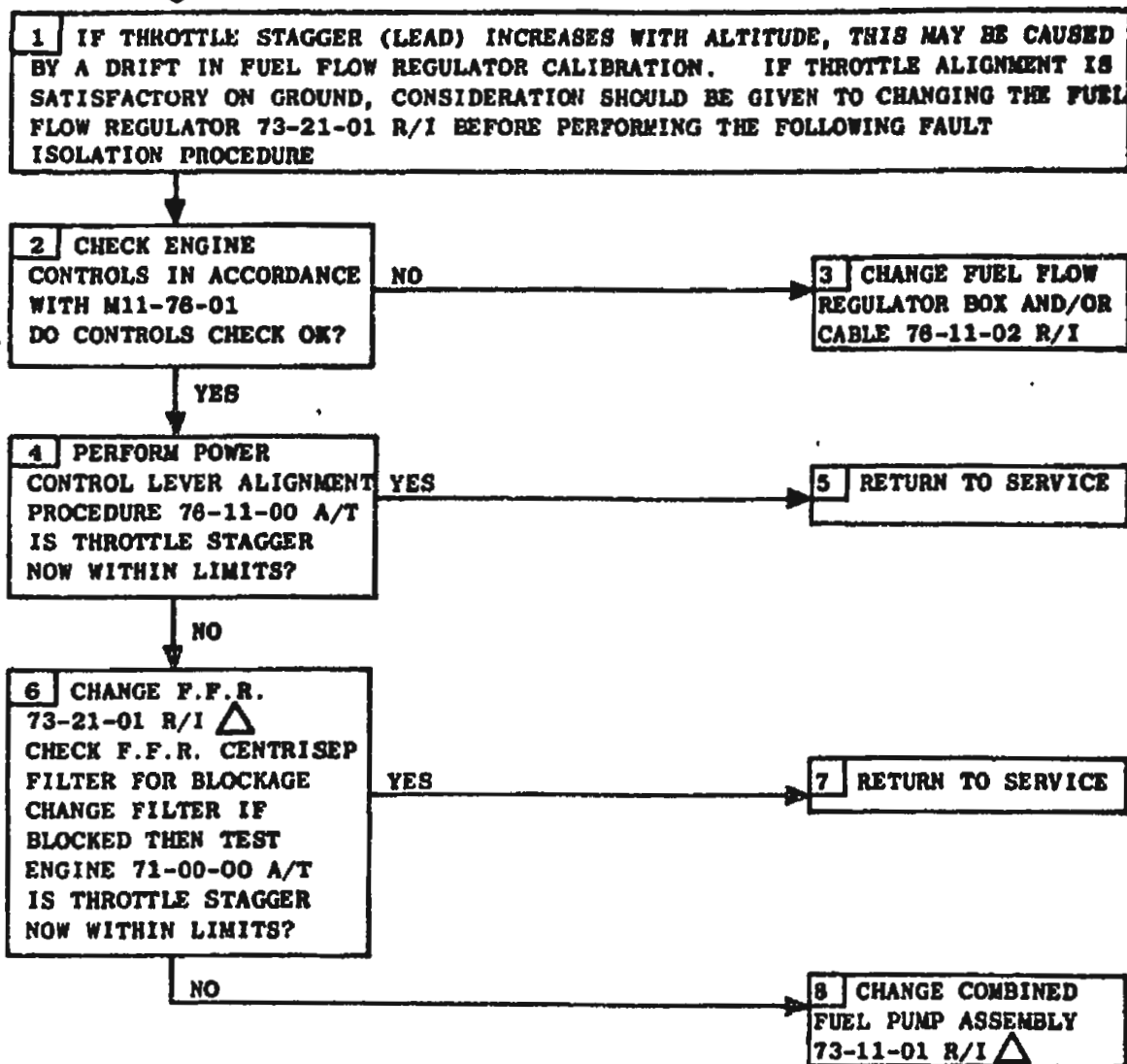
71-83-00
Page 110
Nov 15/87



RB.211 Propulsion System

MAINTENANCE

THROTTLE STAGGER - ONE THROTTLE LEADS



Δ SEE NOTE ON SHEET 1

50095

Throttle stagger - one throttle leads
Fig.105 (Sheet 2 of 2)

EFFECTIVITY: ALL

71-83-00

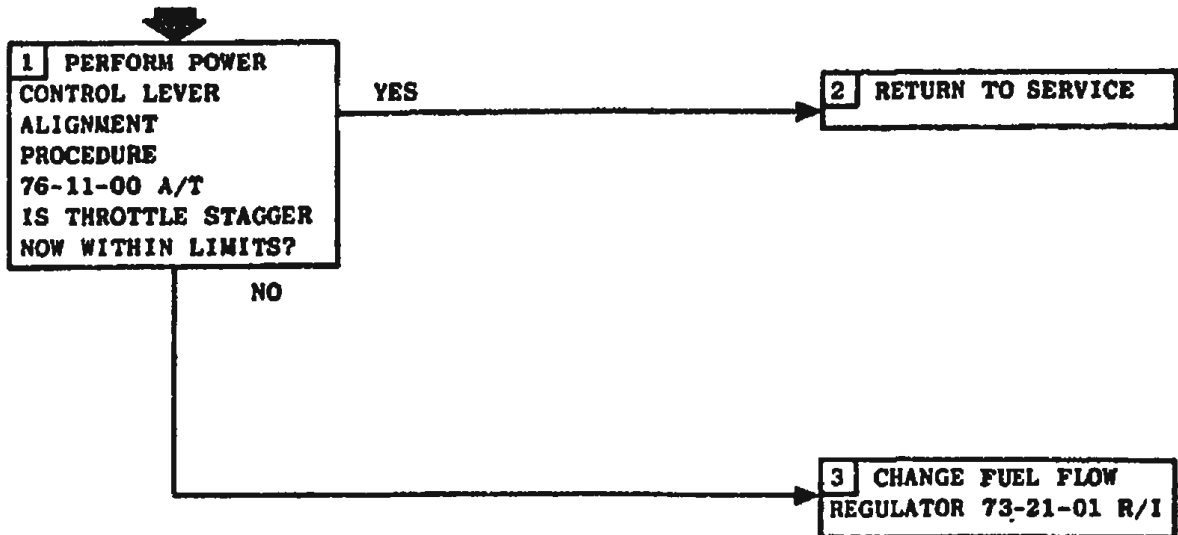
Page 111
Nov 15/87

1G



RB.211 Propulsion System MAINTENANCE

THROTTLE STAGGER - ONE
THROTTLE LAGS



48654

Throttle stagger - one throttle lags
Fig.106

R
R
050B

EFFECTIVITY: ALL

1G

71-83-00
Page 112
Nov 15/87

 RB.211 Propulsion System
MAINTENANCE

ACCELERATION, DECELERATION AND IDLE - FAULT ISOLATION

1. General

The diagrams and schematics in this section can be used for fault isolation any time a fault is reported or suspected. Uncommon abbreviations are defined on the using fault code diagram or schematic.

If the flight crew reports a fault using a fault code number, the code number can be found in the Fault Isolation Reference Table in the Chapter 71 Fault Code Index. The index specifies the exact maintenance manual section, fault isolation diagram, and block number on the diagram where the fault isolation procedure should start. Where applicable, schematics are included at the end of the section to supplement the fault code diagrams or as an aid in isolating a problem not covered on the diagrams.

Refer to the Maintenance Manual Introduction for a more detailed discussion of the Fault Isolation Reporting Method (FIRM) and use of fault isolation diagrams/schematics.

2. Fault Isolation/Identification

Table 101 lists the fault isolation diagrams and schematics in this section.

TABLE 101

		FIGURE	TITLE
		103	Engine slow to accelerate - ground idle normal
		104	Engine slow to accelerate - ground idle high
		105	No response to throttle lever movement
		106	Engine high/low ground idle
		107	Engine rundown following deceleration
R		108	Engine rundown following initial normal acceleration
R			from ground idle
R		109	Engine rundown from ground idle

EFFECTIVITY: ALL

050B

1G

71-84-00
Page 101
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

<u>COMPONENT</u>	<u>QTY</u>	<u>ACCESS/AREA</u>	<u>REFERENCE</u>
AMPLIFIER - SPEED AND TEMPERATURE CONTROL	3	ENGINE: 412,422,432	73-21-02
BOX - CONTROL - FUEL FLOW REGULATOR	3	ENGINE: 412,422,432	76-11-02
COOLER - P4 AIR - FUEL COOLED	3	ENGINE: 412,422,432	73-11-08
REGULATOR - FUEL FLOW	3	ENGINE: 412,422,432	73-21-01
SOLENOID - GROUND IDLE RESET	3	ENGINE: 412,422,432	73-21-01

Component Location Index
Fig.101

R
R
050B

EFFECTIVITY: ALL

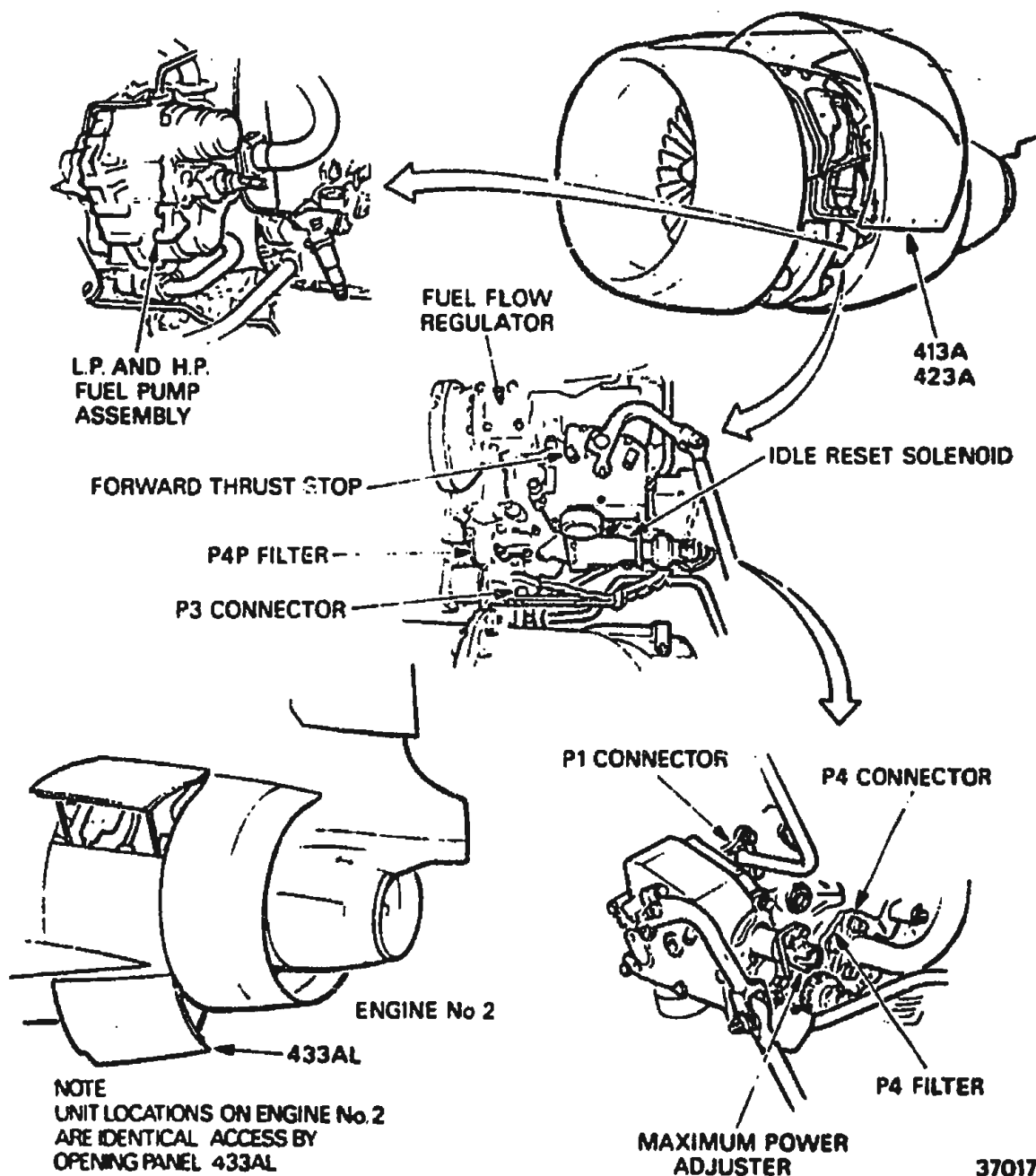
1G

71-84-00
Page 102
Dec 15/91



RB.211 Propulsion System

MAINTENANCE



Component Locator Diagram
Fig.102 (Sheet 1 of 4)

R
R
050B

EFFECTIVITY: ALL

1A

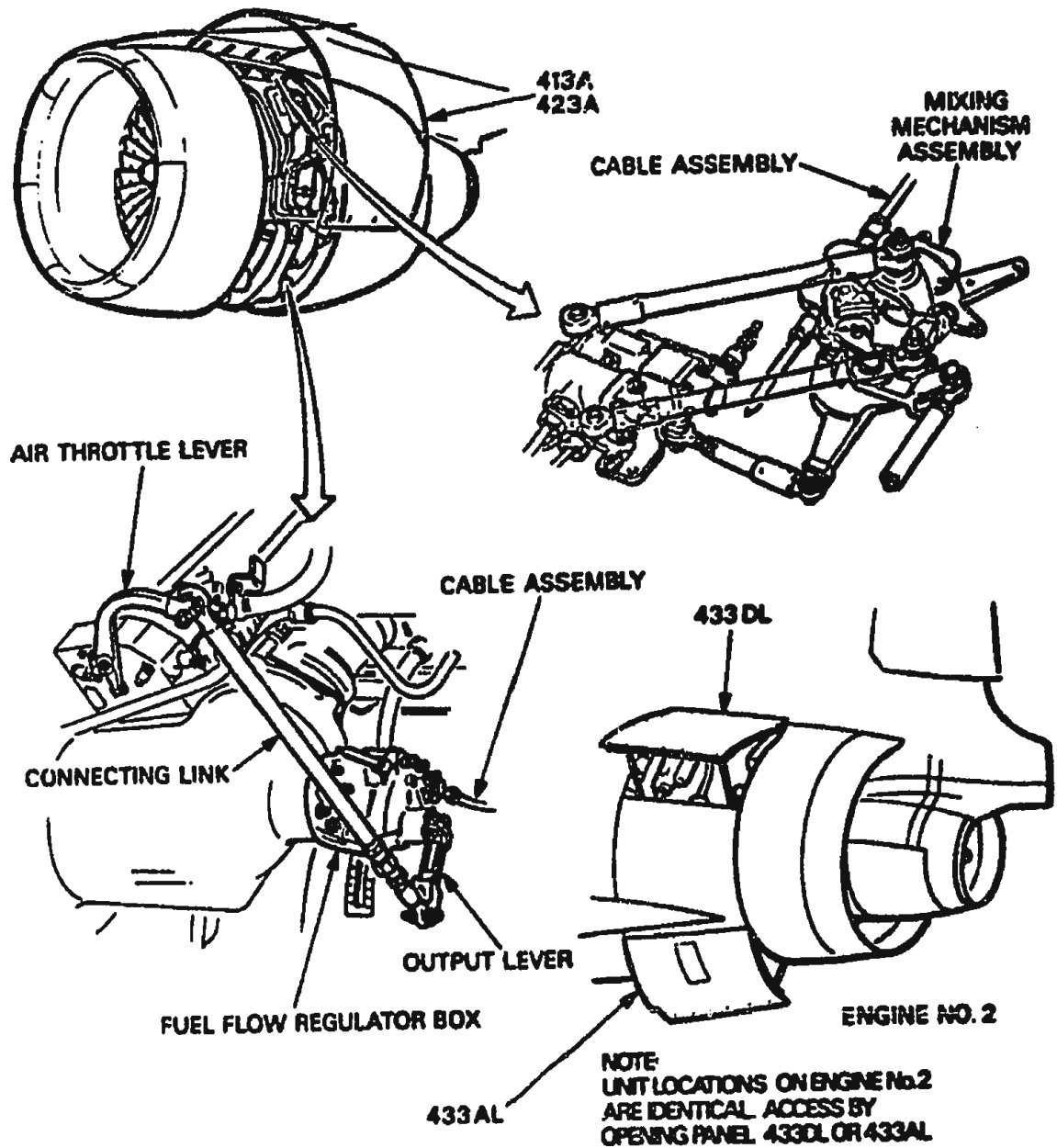
71-84-00

Page 103
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



37019

Component Locator Diagram
Fig. 102 (Sheet 2 of 4)

R
R
0508

EFFECTIVITY: ALL

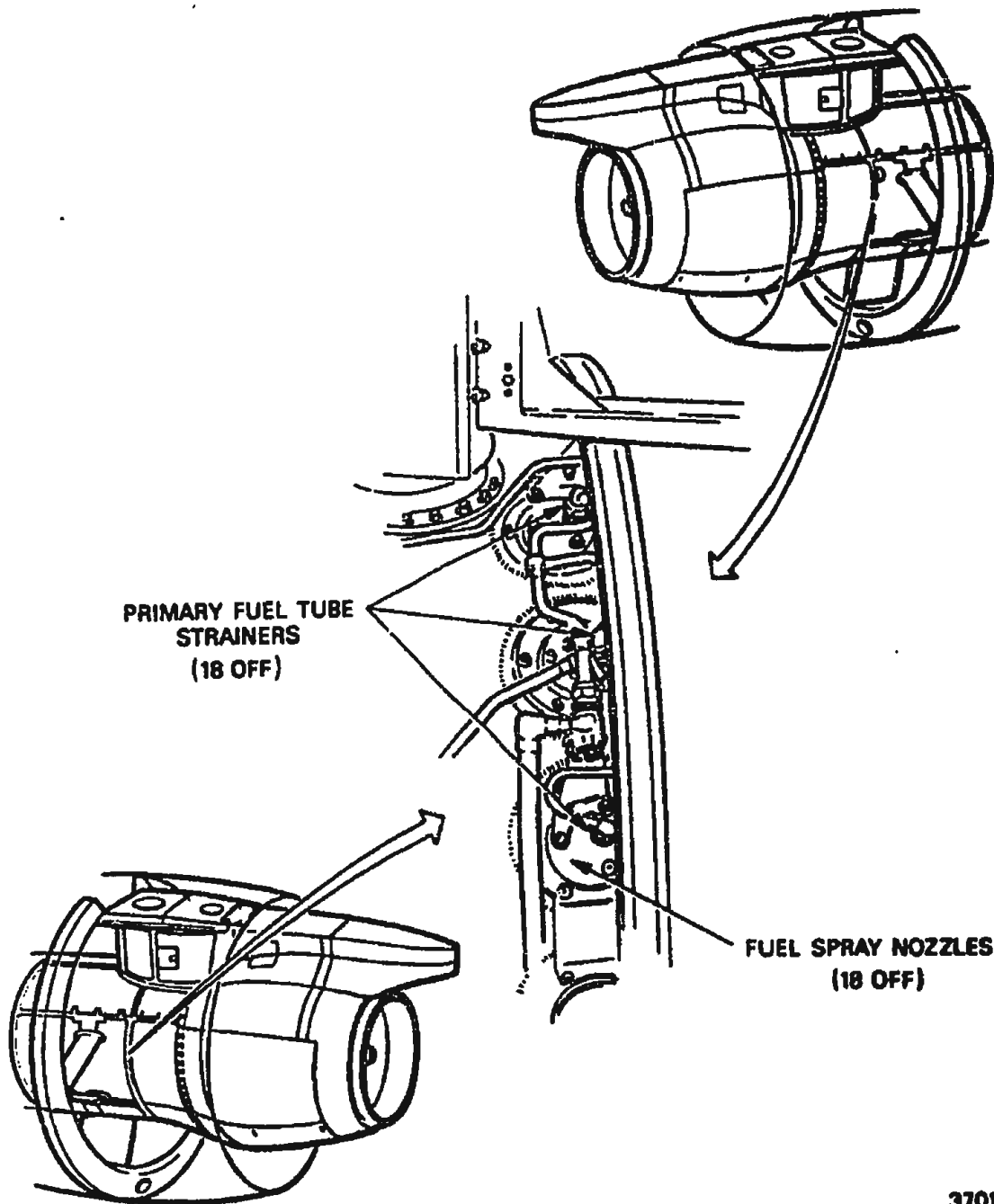
1A

71-84-00
Page 104
Nov 15/81



RB.211 Propulsion System

MAINTENANCE



37018

Component Locator Diagram
Fig.102 (Sheet 3 of 4)

R
R
050B

EFFECTIVITY: ALL

1A

71-84-00
Page 105
Nov 15/81

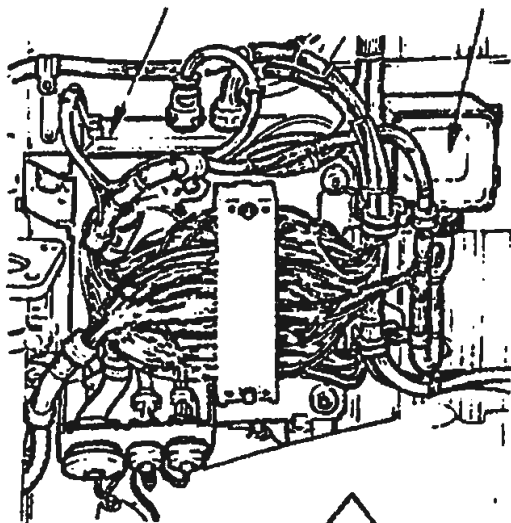


RB.211 Propulsion System

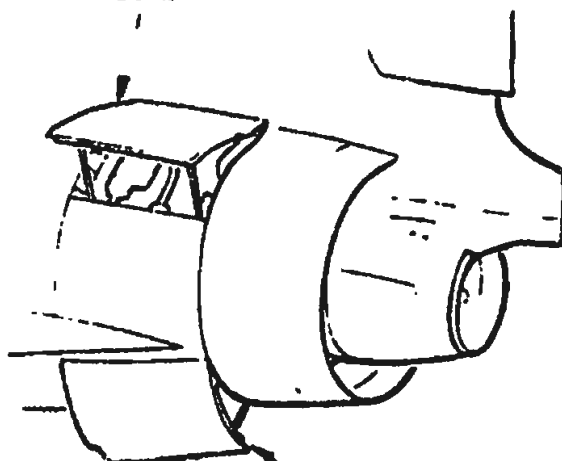
MAINTENANCE

SPEED AND TEMPERATURE
CONTROL AMPLIFIER

SPEED
SWITCH



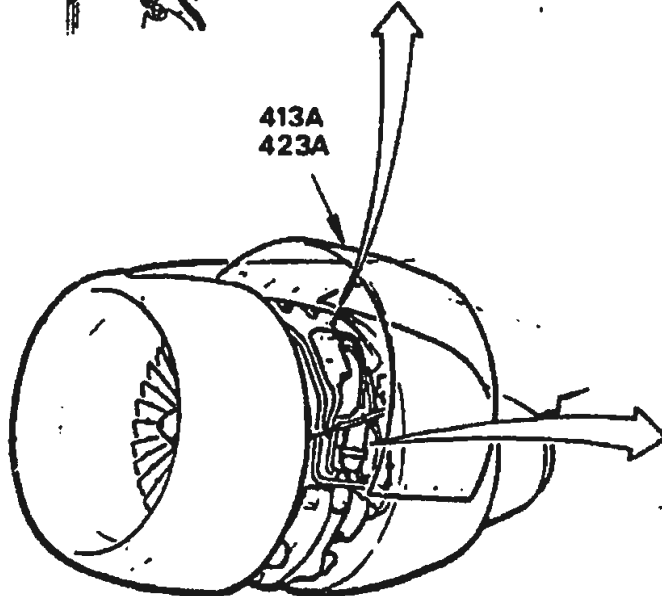
433DL



433AL ENGINE No.2

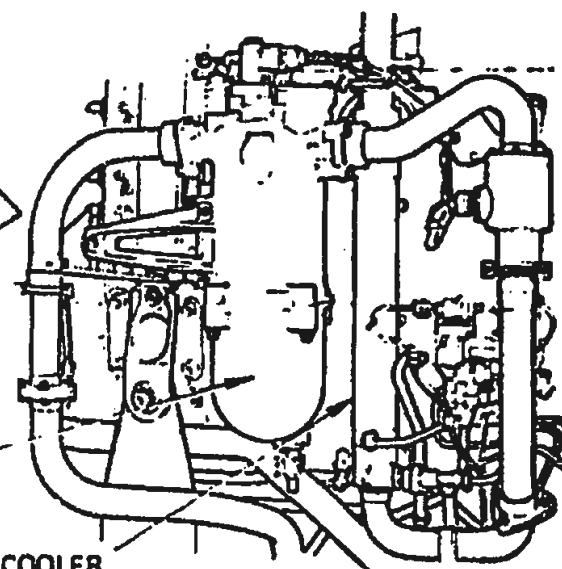
NOTE
UNIT LOCATIONS ON ENGINE No.2
ARE IDENTICAL ACCESS BY
OPENING PANEL 433AL AND 433DL

413A
423A



LP FUEL FILTER

FUEL COOLED P4 AIR COOLER



37016

Component Locator Diagram
Fig.102 (Sheet 4 of 4)

EFFECTIVITY: ALL

71-84-00

Page 106
Nov 15/81

1A

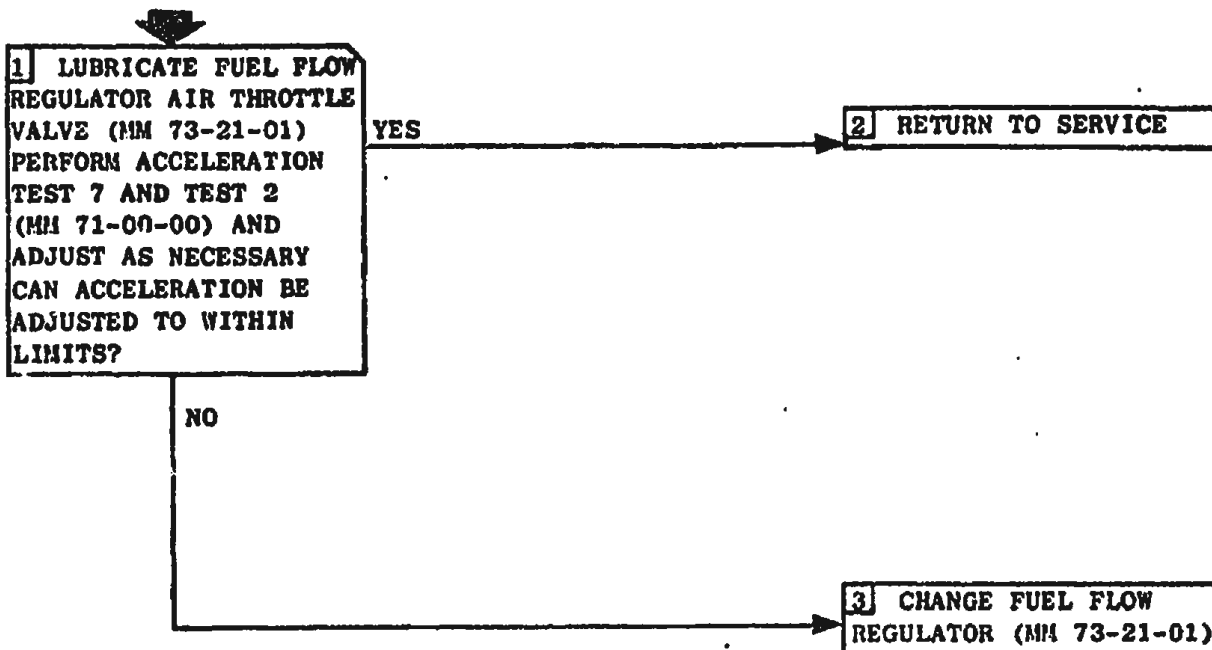
R
R
050B



RB.211 Propulsion System

MAINTENANCE

ENGINE SLOW TO ACCELERATE -
GROUND IDLE NORMAL



50058A

CR
CR

Engine slow to accelerate - ground idle normal
Fig.103

EFFECTIVITY: ALL

050B

1G

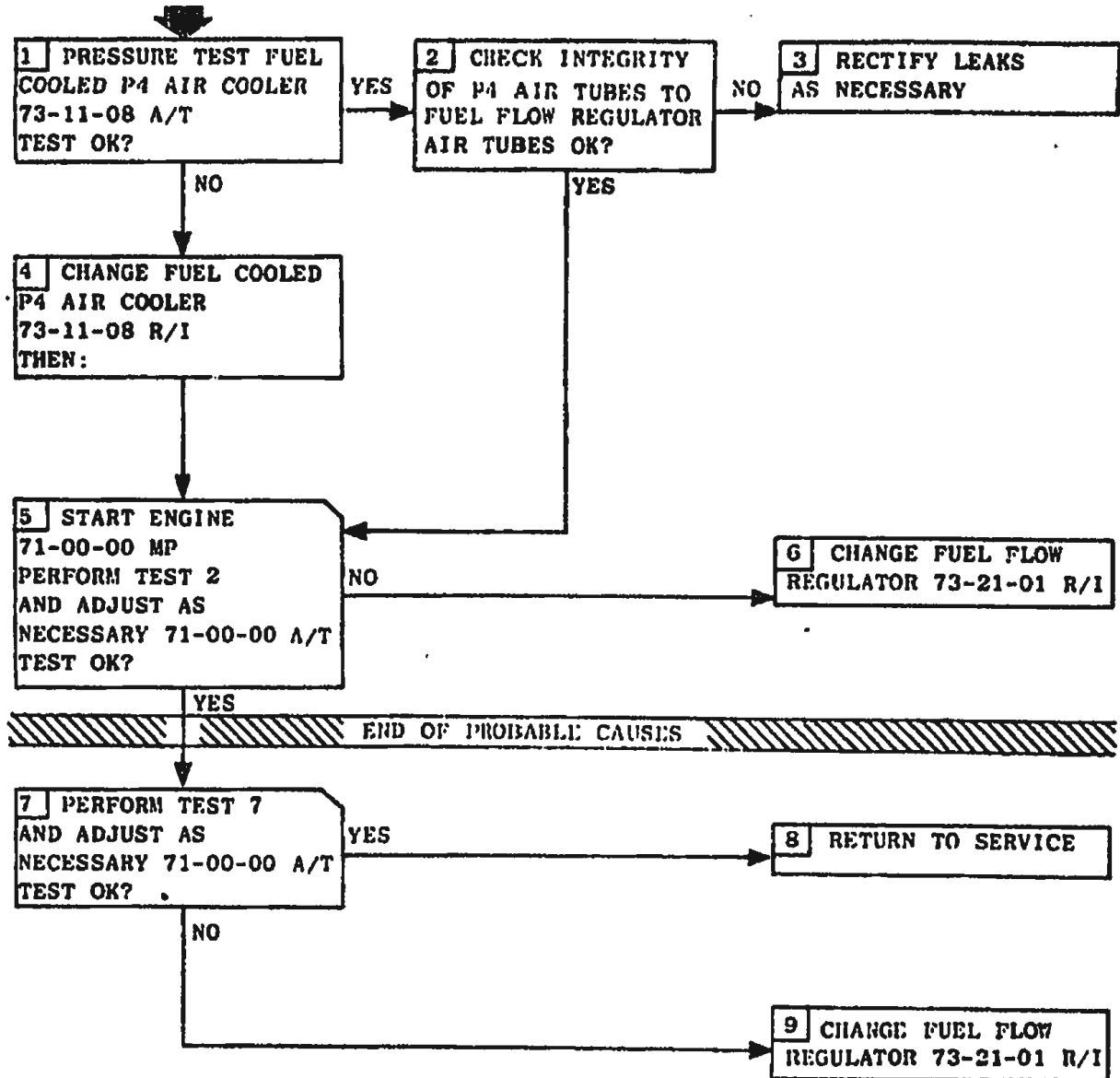
71-84-00
Page 107
May 15/85



RB.211 Propulsion System

MAINTENANCE

ENGINE SLOW TO ACCELERATE -
GROUND IDLE HIGH



50057 A

CR
CR

Engine slow to accelerate - ground idle high
Fig.104

EFFECTIVITY: ALL

050B

1G

71-84-00
Page 108
Nov 15/83



RB.211 Propulsion System

MAINTENANCE

Notes referred to during fault isolation procedures:

1. If on unit removal the fuel system is found to be contaminated by metal or other foreign debris, the fuel filter in the H.P. fuel tube to fuel spray nozzle manifold must be replaced. (Ref. 73-11-09, Removal Installation) within 750 hours.

No response to throttle lever movement
Fig.105 (Sheet 1 of 2)

R
R
050B

EFFECTIVITY: ALL

1G

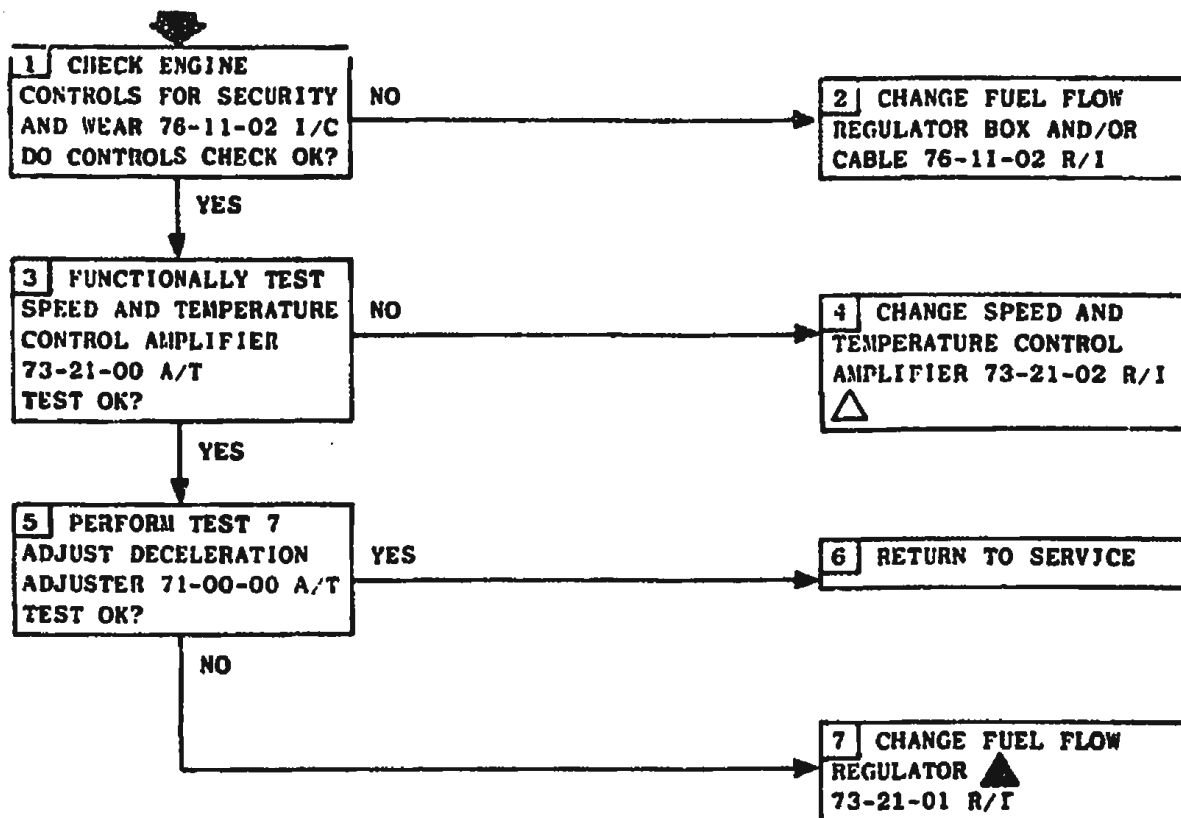
71-84-00
Page 109
May 15/85



RB.211 Propulsion System

MAINTENANCE

NO RESPONSE TO THROTTLE LEVER MOVEMENT



⚠ CAUTION: ON ENGINE NO.2, THE STA103 AMPLIFIER AND THE FB100 FILTER MUST BE CHANGED TOGETHER. FAILURE TO DO SO MAY RESULT IN DAMAGE TO NEW AMPLIFIER DUE TO DEFECTIVE FB100 FILTER.

⚠ SEE NOTE 1. ON SHEET 1

50082

CR
CR

No response to throttle lever movement
Fig.105 (Sheet 2 of 2)

EFFECTIVITY: ALL

050B

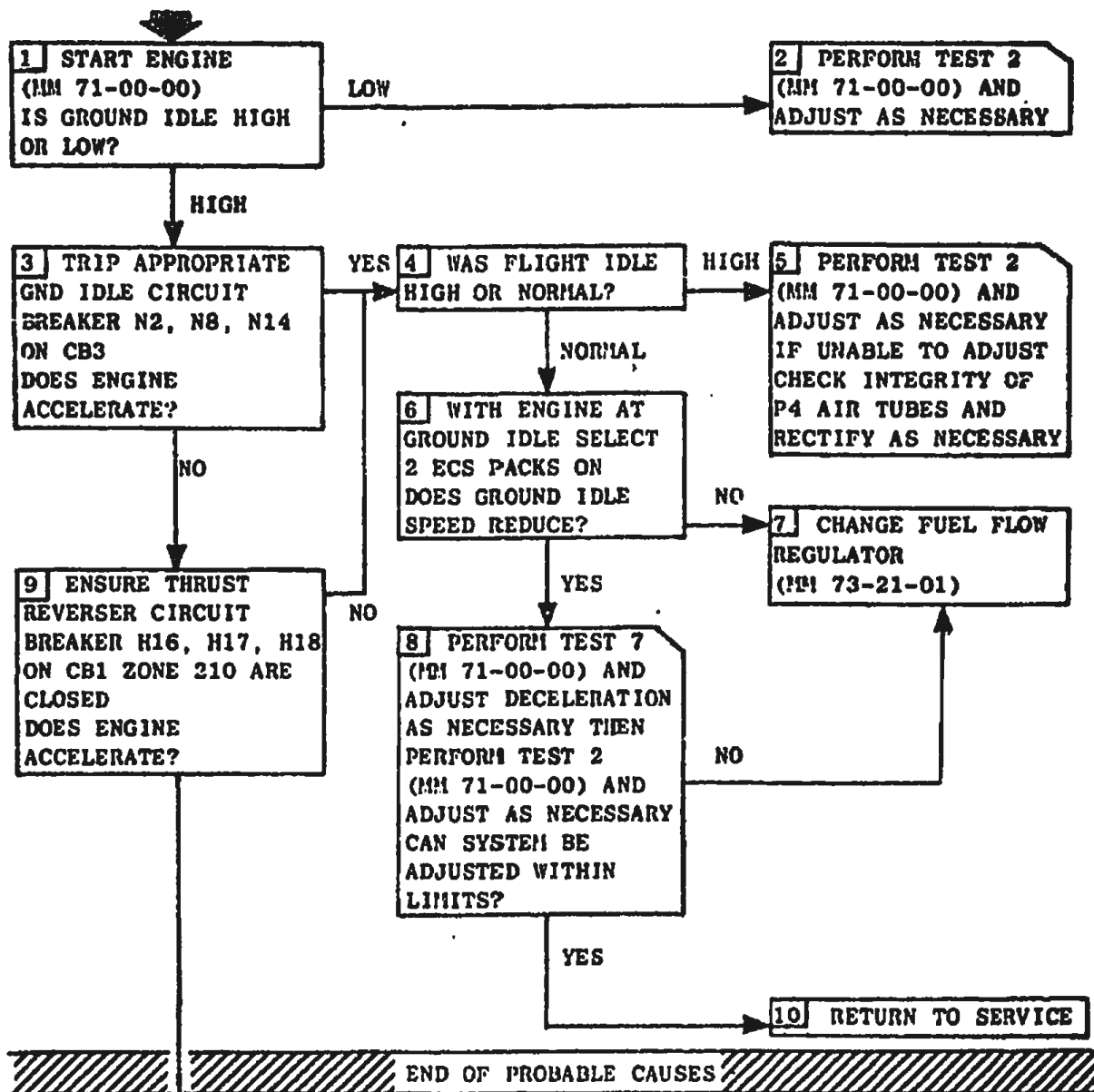
16

71-84-00
Page 110
May 15/82



RB.211 Propulsion System MAINTENANCE

ENGINE HIGH/LOW GROUND IDLE



TO SHEET 2

50055A

CR
CR

Engine high/low ground idle
Fig.106 (Sheet 1 of 2)

EFFECTIVITY: ALL

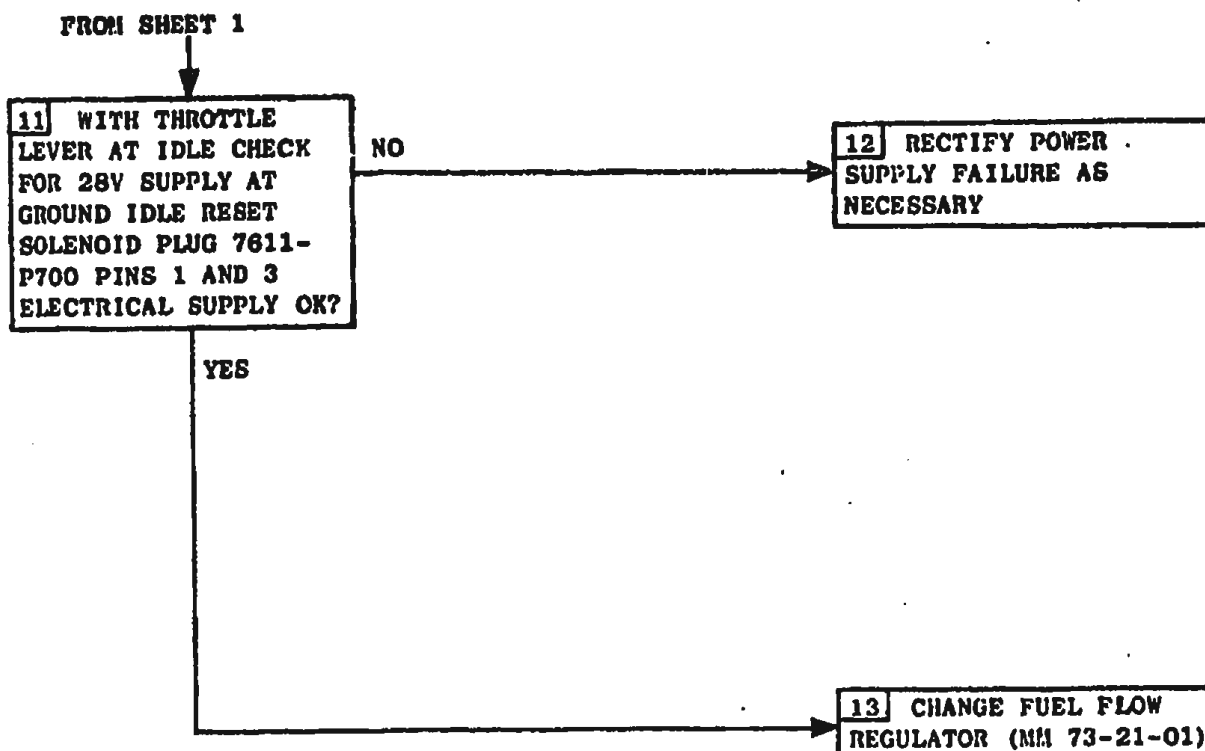
050B

16

71-84-00
Page 111
May 15/85



RB.211 Propulsion System MAINTENANCE



50056B

CR
CR

Engine high/low ground idle
Fig.106 (Sheet 2 of 2)

EFFECTIVITY: ALL

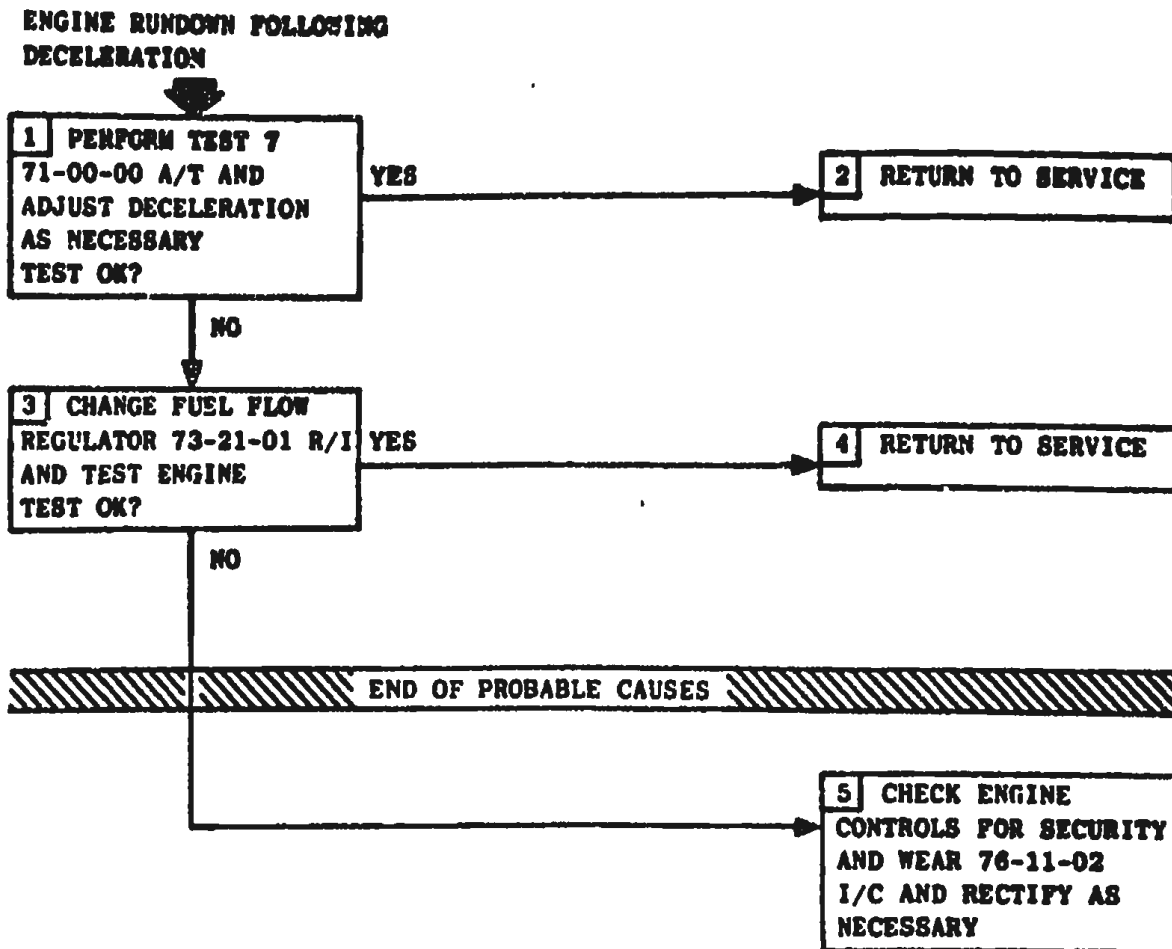
050B

1G

71-84-00
Page 112
May 15/85



RB.211 Propulsion System MAINTENANCE



50054

Engine rundown following deceleration
Engines without S.B.71-5474
Fig.107 (Sheet 1 of 2)

C
C
C
R
R
050B

EFFECTIVITY: ALL

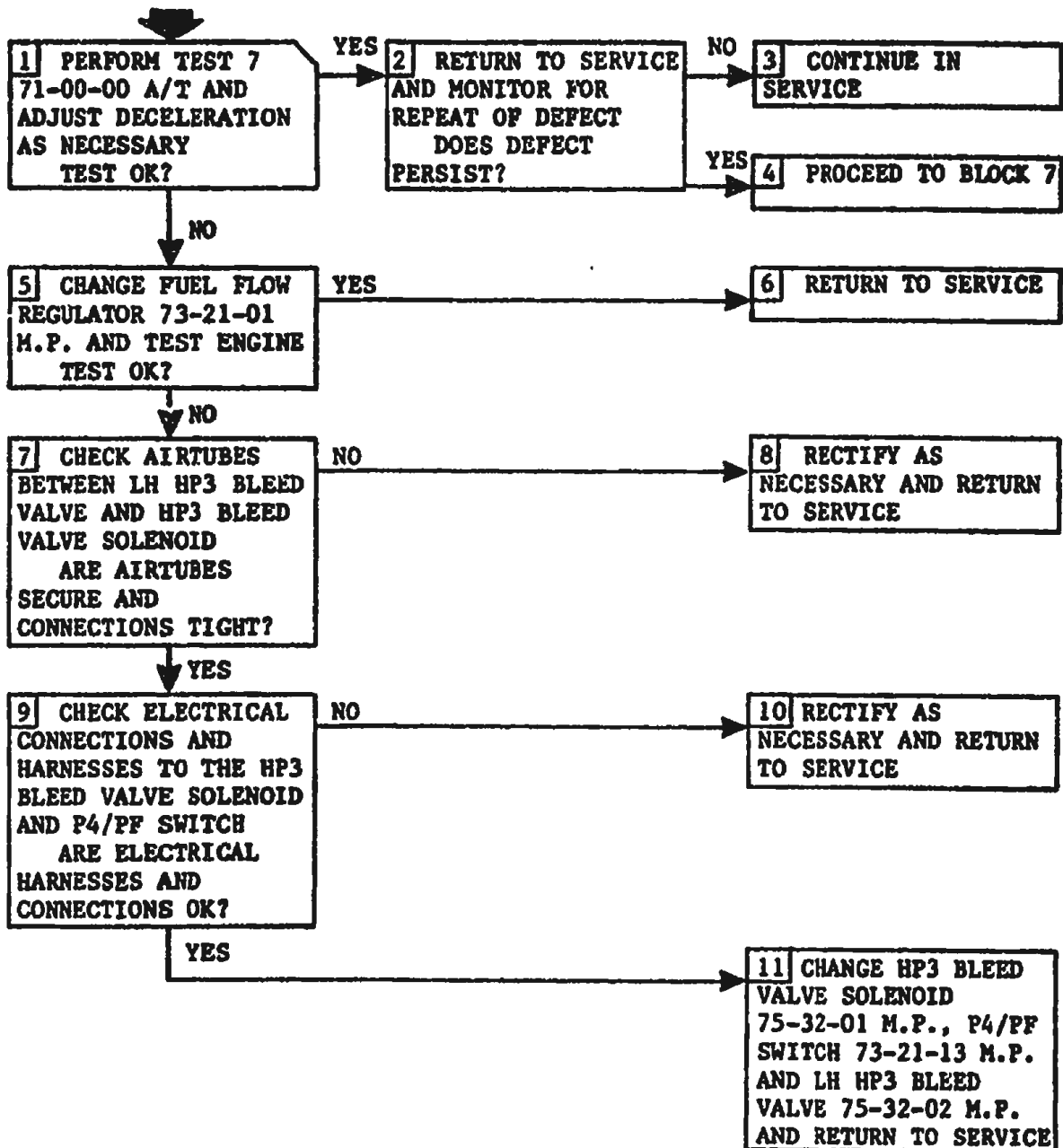
1G

71-84-00
Page 113
Dec 15/91



RB.211 Propulsion System MAINTENANCE

ENGINE RUNDOWN FOLLOWING DECELERATION



A2019

CR
CR
CR

Engine rundown following deceleration
Engines with S.B.71-5474
Fig.107 (Sheet 2 of 2)

R EFFECTIVITY: ALL

050B

1G

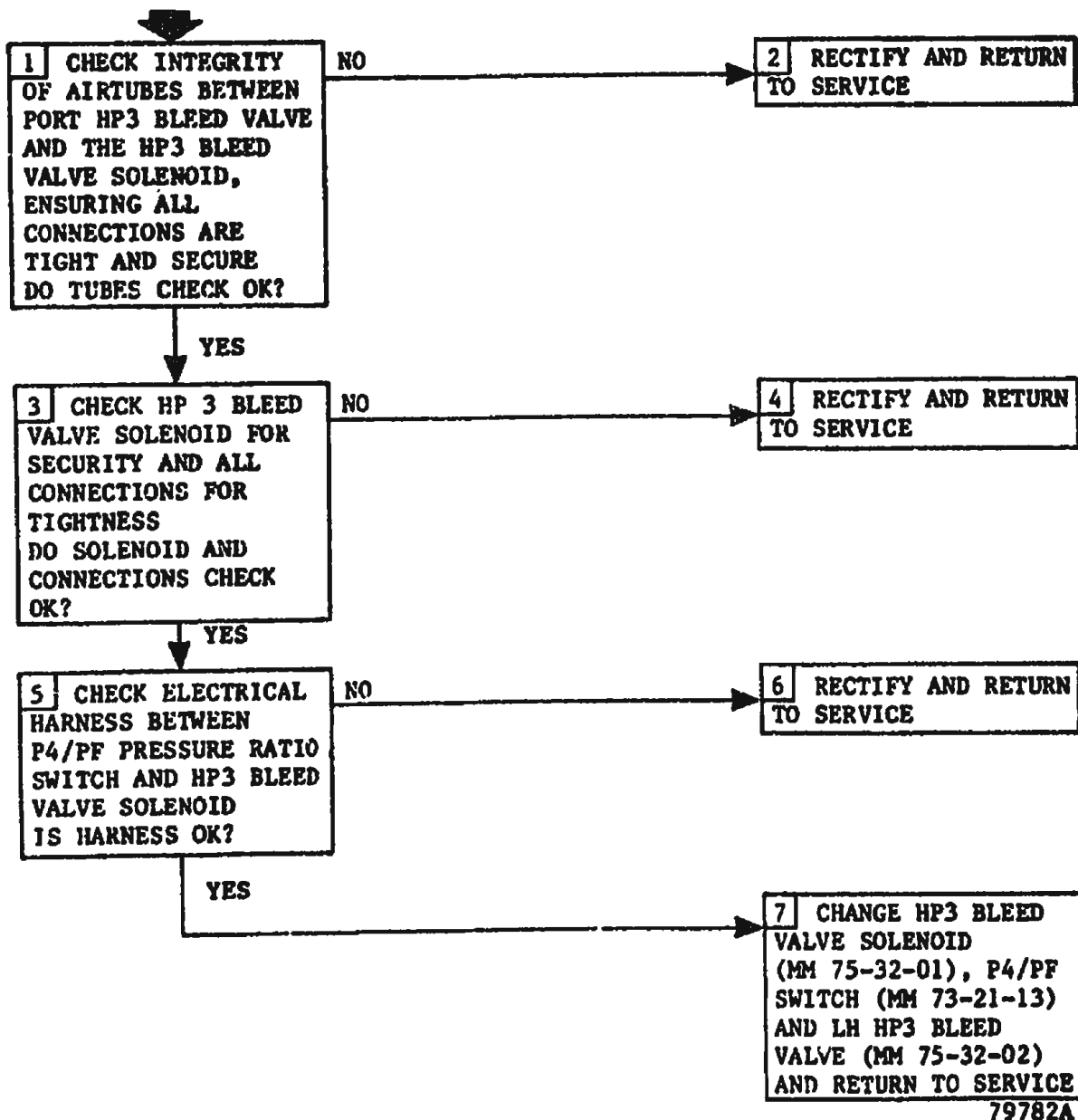
71-84-00

Page 114
Dec 15/91



RB.211 Propulsion System MAINTENANCE

ENGINE RUNDOWN FOLLOWING
INITIAL NORMAL ACCELERATION
FROM GROUND IDLE



Engine rundown to sub-idle following initial
normal acceleration from ground idle - Engines with SB 71-5474
Fig.108

R
R
R

R
R

EFFECTIVITY: ALL

050B

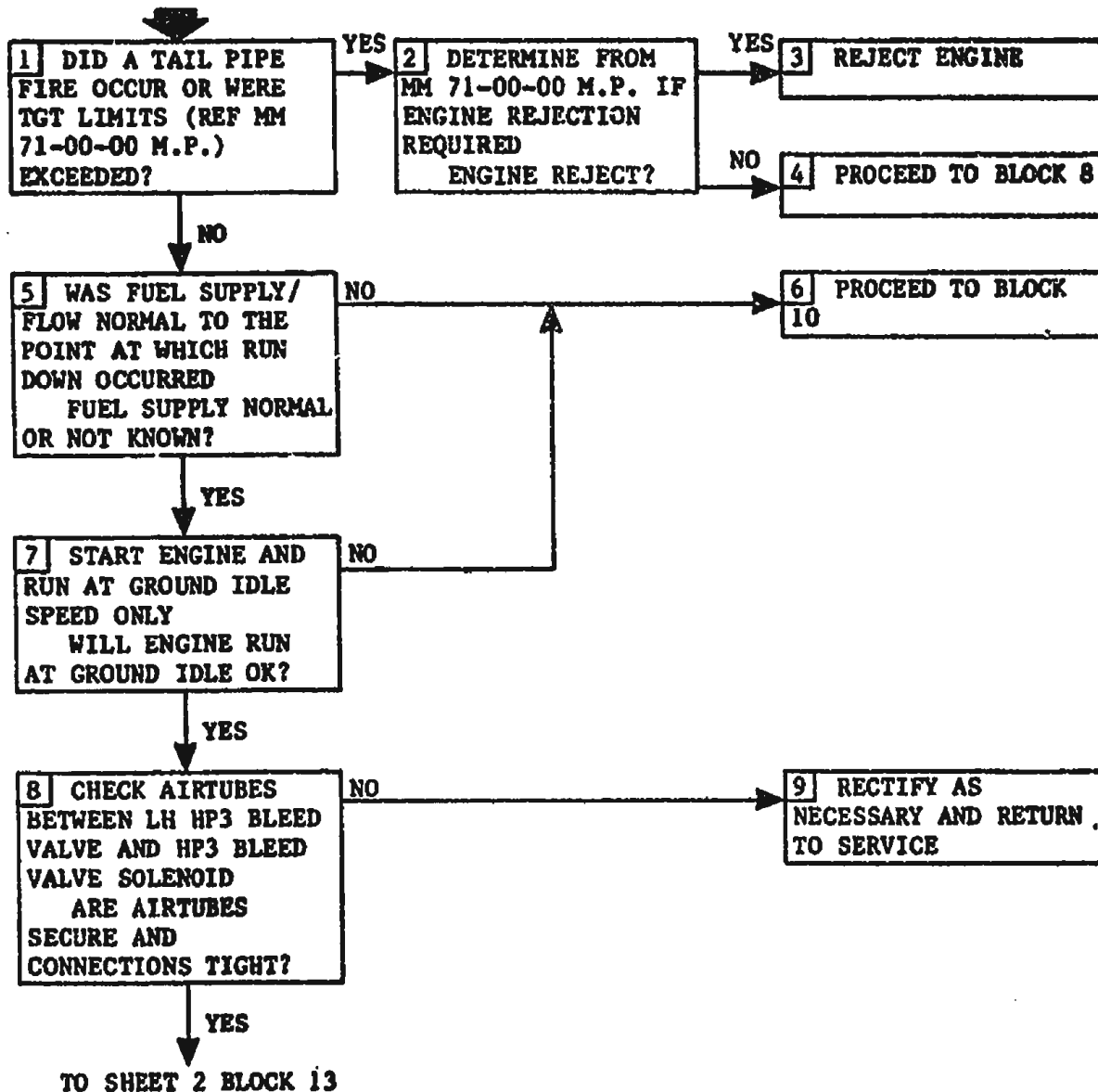
1G

71-84-00
Page 115
Dec 15/91



RB.211 Propulsion System MAINTENANCE

ENGINE RUNDOWN FROM GROUND IDLE



A2016

Engine rundown from ground idle
Engines with S.B.71-5474
Fig.109 (Sheet 1 of 2)

R
R
R

R EFFECTIVITY: ALL

050B

1G

71-84-00
Page 116
Dec 15/91

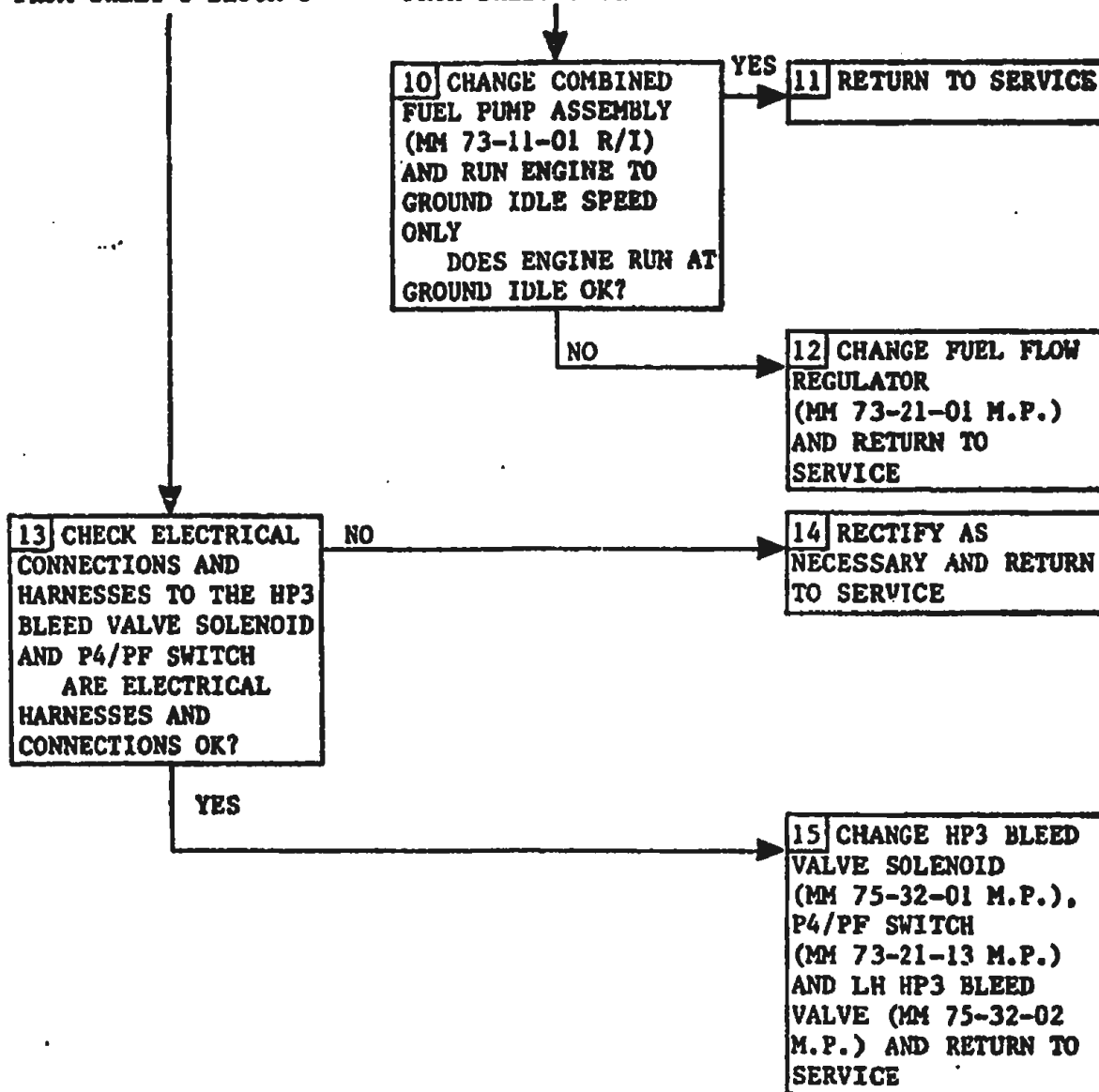


RB.211 Propulsion System

MAINTENANCE

FROM SHEET 1 BLOCK 8

FROM SHEET 1 BLOCK 6



A2017

Engine rundown from ground idle
Engines with S.B.71-5474
Fig.109 (Sheet 2 of 2)

R
R
R

R
R

EFFECTIVITY: ALL

050B

1G

71-84-00
Page 117/118
Dec 15/91



RB.211 Propulsion System

MAINTENANCE

SHAFT SPEED FAULTS - FAULT ISOLATION

1. General

The diagrams and schematics in this section can be used for fault isolation any time a fault is reported or suspected. Uncommon abbreviations are defined on the using fault code diagram or schematic.

If the flight crew reports a trouble using a fault code number, the code number can be found in the Fault Isolation Reference Table in the Chapter 71 Fault Code Index. The index specifies the exact maintenance manual section, fault isolation diagram, and block number on the diagram where the fault isolation procedure should start. Where applicable, schematics are included at the end of the section to supplement the fault code diagrams or as an aid in isolating a problem not covered on the diagrams.

Refer to the Maintenance Manual Introduction for a more detailed discussion of the Fault Isolation Reporting Method (FIRM) and use of fault isolation diagrams/schematics.

2. Fault Isolation/Identification

Table 101 lists the fault isolation diagrams and schematics in this section.

TABLE 101

FIGURE	TITLE
103	N2 trend high/low
104	High N2 up to and including 102.5%
105	N2 overspeed above 102.5% up to and including 106%
106	N2 overspeed above 106% up to and including 115%
107	N2 overspeed above 115%
R 108	N1 overspeed above 101% up to and including 103%

EFFECTIVITY: ALL

050B

1A

71-86-00

Page 101
Dec 15/95



RB.211 Propulsion System

MAINTENANCE

<u>COMPONENT</u>	<u>QTY</u>	<u>ACCESS/AREA</u>	<u>REFERENCE</u>
MASTER RAM - V.I.G.V.	3	ENGINE: 412BR, 422BR, 432BR	75-31-01
SLAVE RAM - V.I.G.V.	3	ENGINE: 412BR, 422BR, 432BR	75-32-02

Component Location Index
Fig.101

R
R
050B

EFFECTIVITY: ALL

1G

71-86-00
Page 102
May 15/86



RB.211 Propulsion System

MAINTENANCE

To be issued later

Component Location Diagram
Fig.102

R
R
050B

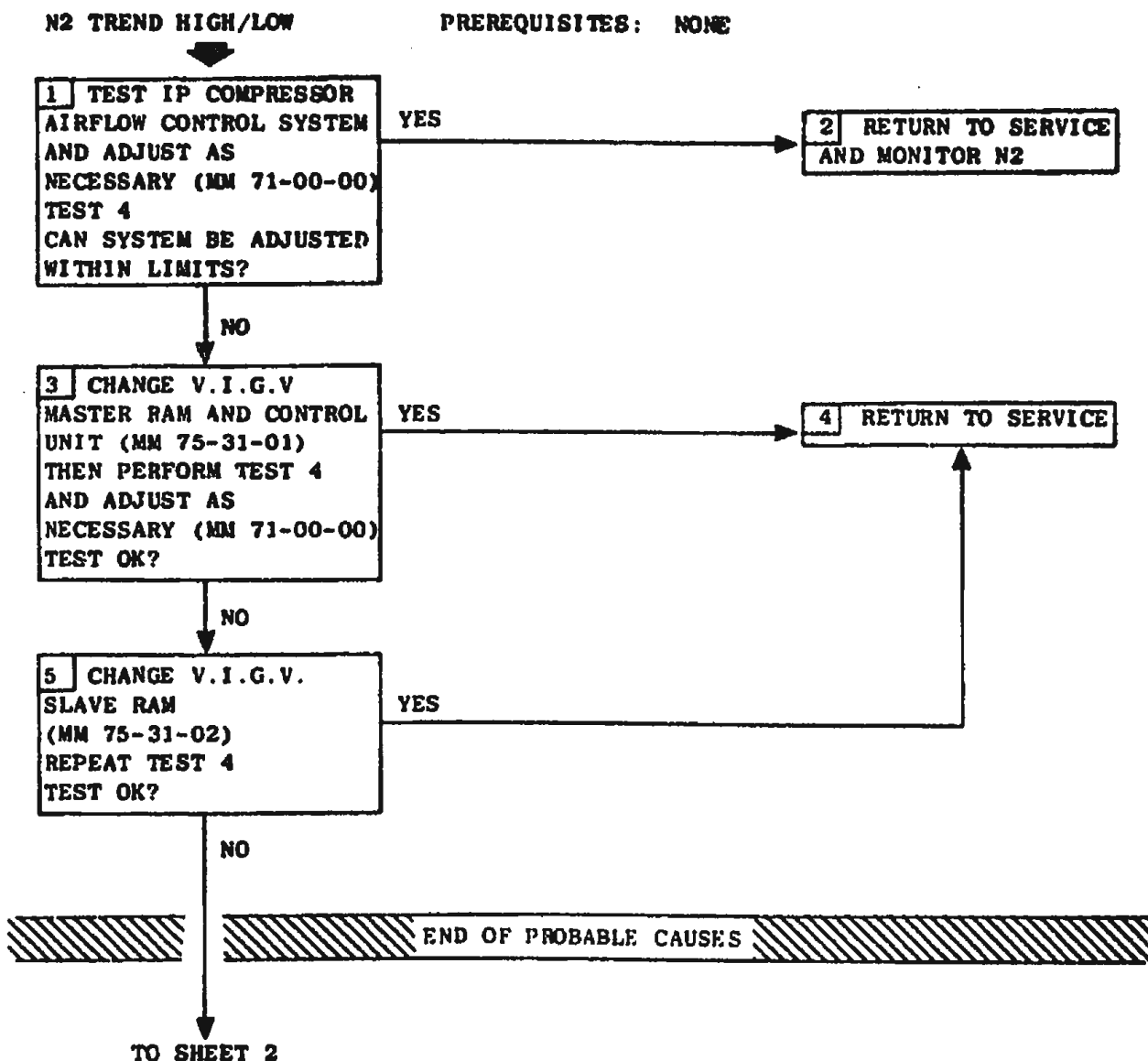
EFFECTIVITY: ALL

16

71-86-00
Page 103
May 15/86



RB.211 Propulsion System MAINTENANCE



50015A

N2 trend high/low
Fig.103 (Sheet 1 of 2)

R
R
050B

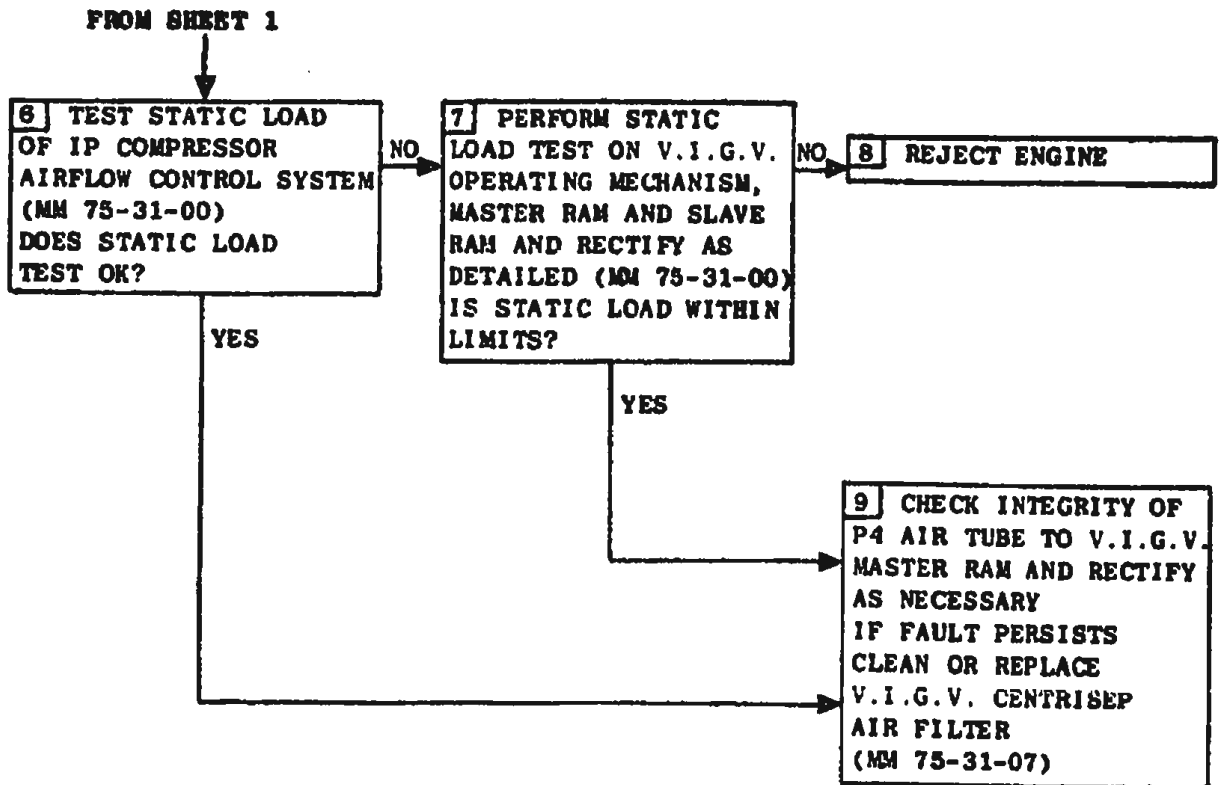
EFFECTIVITY: ALL

1A

71-86-00
Page 104
Dec 15/91



RB.211 Propulsion System MAINTENANCE



79754

N2 trend high/low
Fig.103 (Sheet 2 of 2)

R
R
050B

EFFECTIVITY: ALL

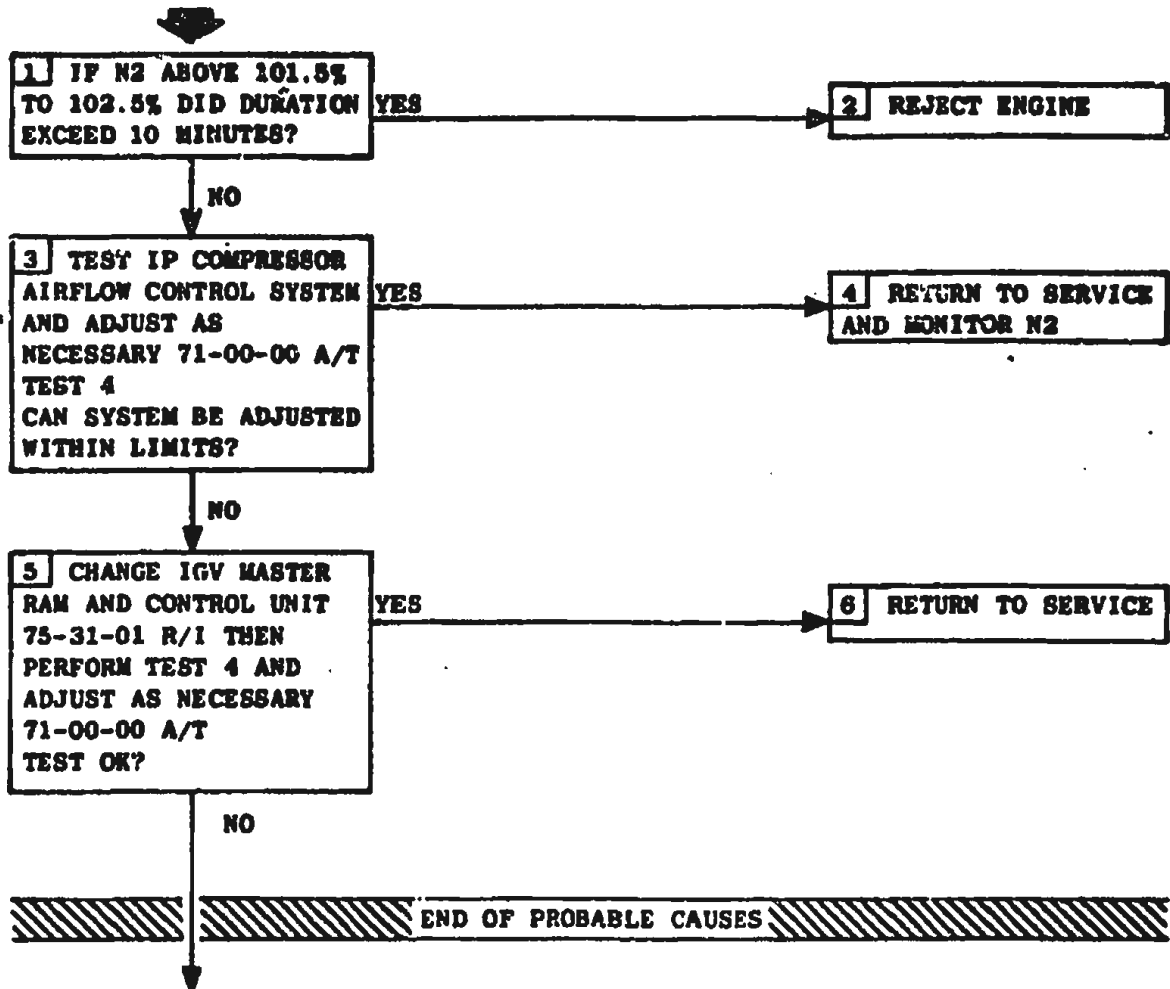
1A

71-86-00
Page 105
Dec 15/91



RB.211 Propulsion System MAINTENANCE

HIGH N2 UP TO AND INCLUDING 102.5%
- OTHER PARAMETERS NORMAL FOR EPR SELECTED



TO 71-86-00 FIG.104 SHEET 2

50016A

High N2 up to and including 102.5%
- other parameters normal for E.P.R. selected
Fig.104 (Sheet 1 of 2)

R
R
050B

EFFECTIVITY: ALL

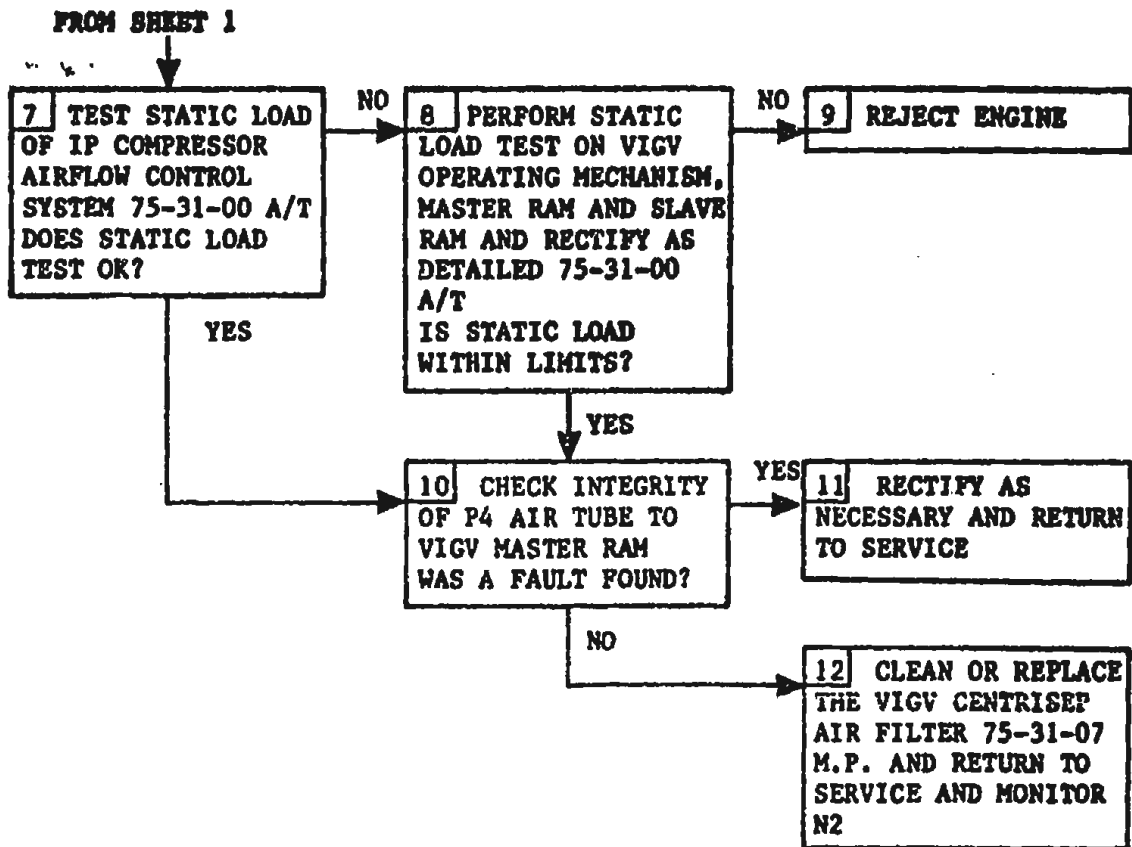
1A

71-86-00
Page 106
Dec 15/91



RB.211 Propulsion System

MAINTENANCE



50017A

R
R
R

High N2 up to and including 102.5%
- other parameters normal for E.P.R. selected
Fig.104 (Sheet 2 of 2)

EFFECTIVITY: ALL

0508

1A

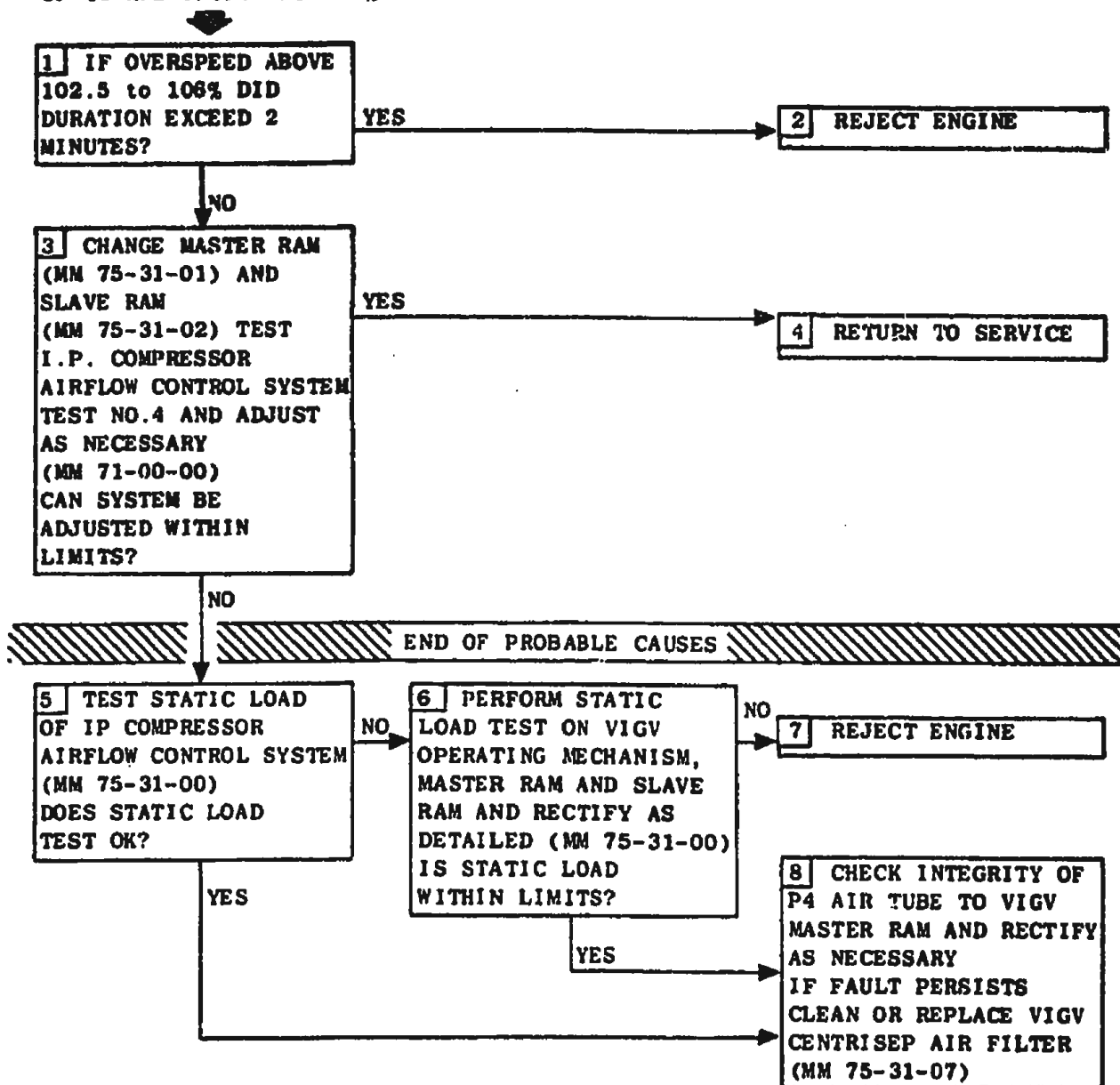
71-86-00
Page 107
Dec 15/91



RB.211 Propulsion System MAINTENANCE

N2 OVERSPEED ABOVE 102.5%
UP TO AND INCLUDING 106%

PREREQUISITES: NONE



50046B

N2 overspeed above 102.5% up to and including 106%
Fig.105

R
R
050B

EFFECTIVITY: ALL

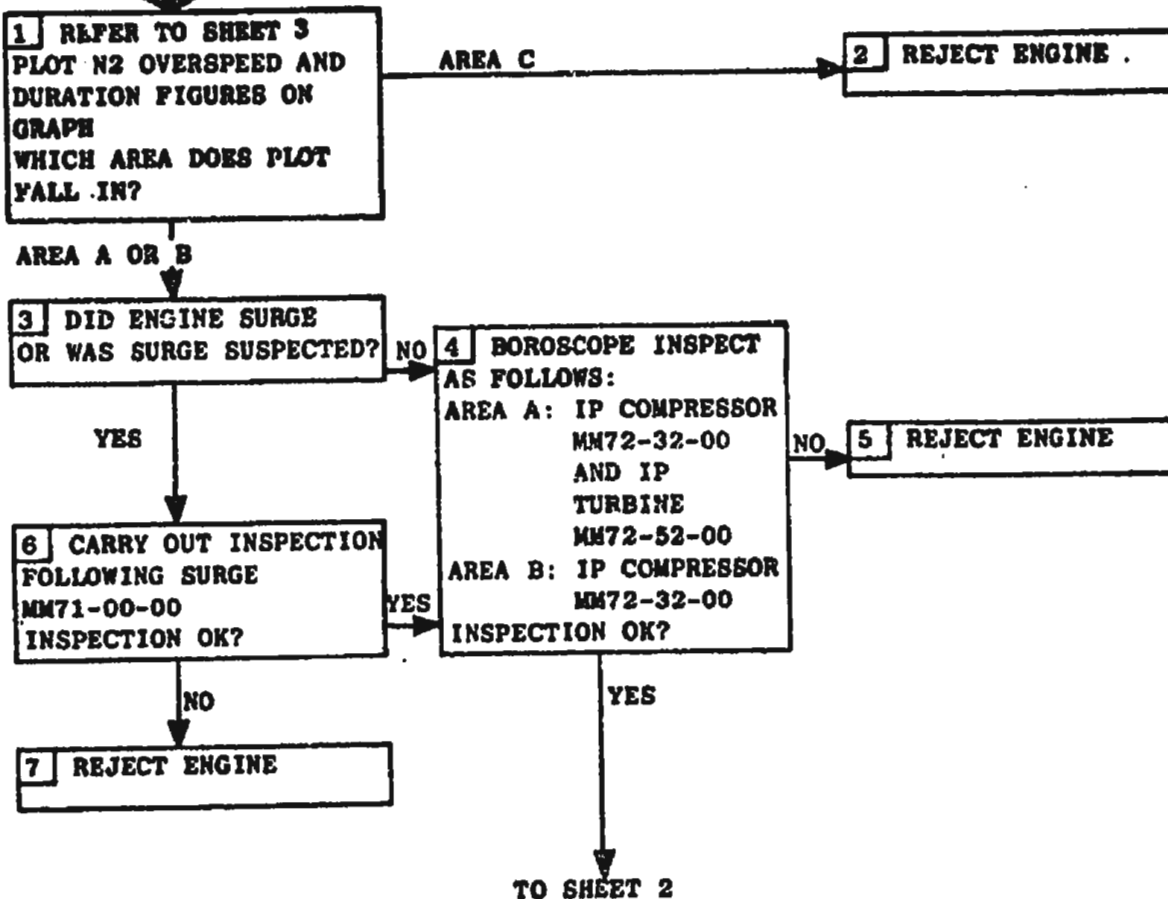
1A

71-86-00
Page 108
Dec 15/91



RB.211 Propulsion System MAINTENANCE

N2 OVERSPEED ABOVE
106% UP TO AND
INCLUDING 115%



57510B

N2 overspeed above 106% up to and including 115%
Fig.106 (Sheet 1)

R R EFFECTIVITY: ALL

050B

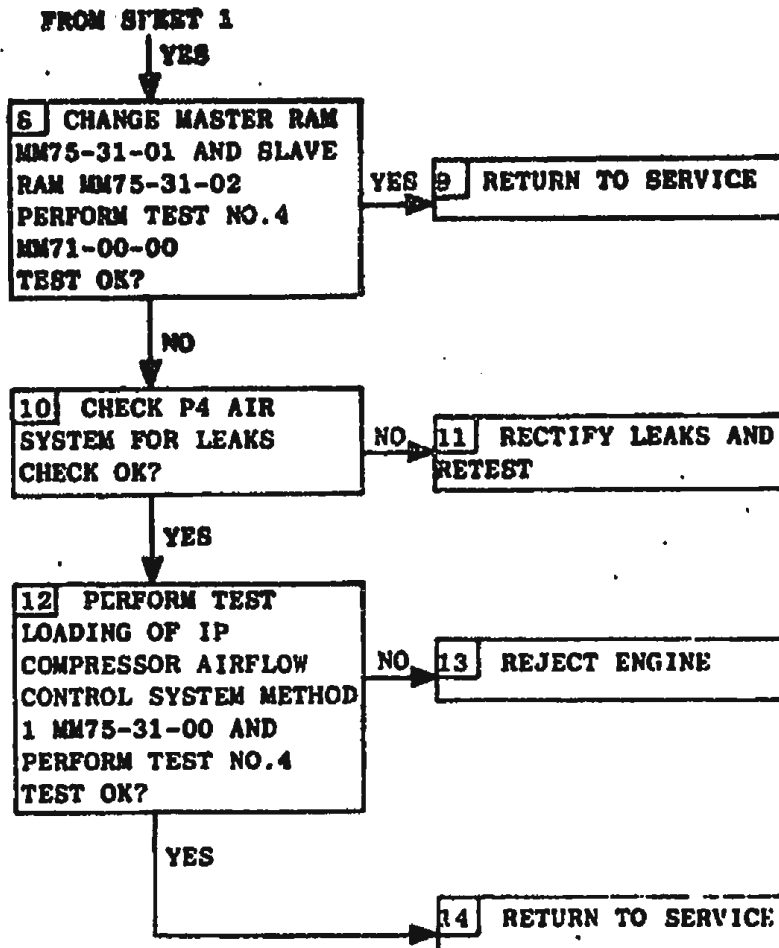
1A

71-86-00
Page 109
Dec 15/91



RB.211 Propulsion System

MAINTENANCE



79705

N2 overspeed above 106% up to and including 115%
Fig.106 (Sheet 2)

R
R
050B

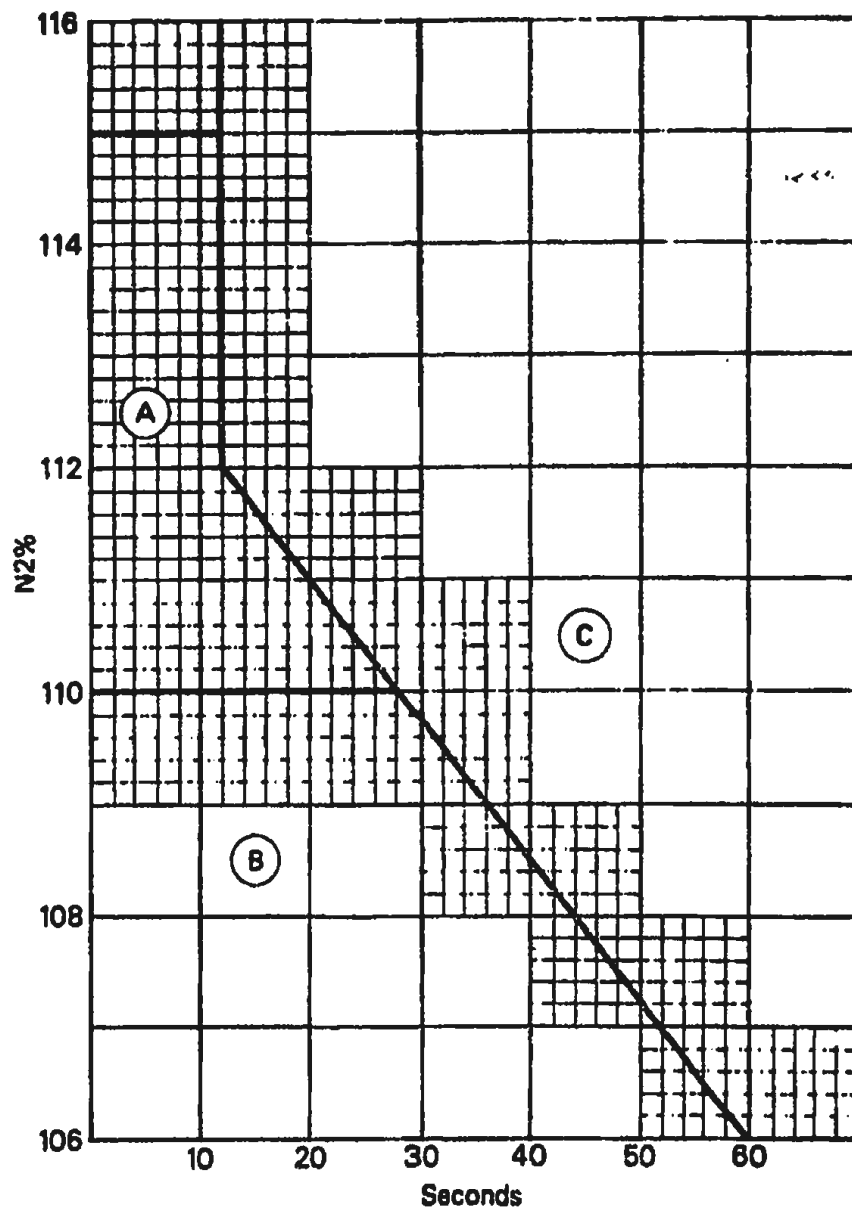
EFFECTIVITY: ALL

1A

71-86-00
Page 110
Dec 15/91



RB.211 Propulsion System MAINTENANCE



58706

N2 overspeed above 106% up to and including 115%
Fig.106 (Sheet 3)

R
R
050B

EFFECTIVITY: ALL

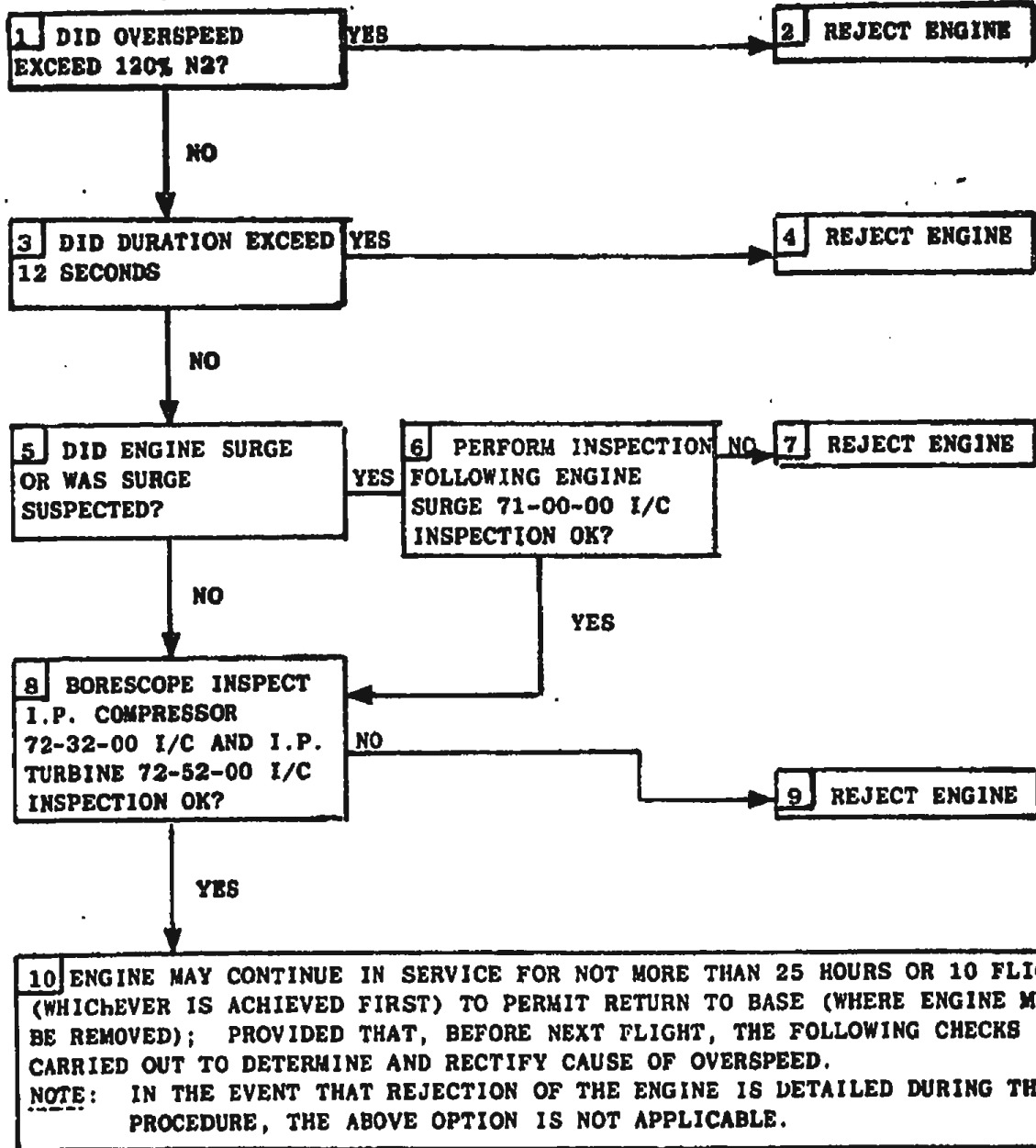
1A

71-86-00
Page 111
Dec 15/91



RB.211 Propulsion System MAINTENANCE

**N2 OVERSPEED ABOVE
115% N2**



TO SHEET 2

79701

N2 overspeed above 115%
Fig.107 (Sheet 1 of 2)

R R EFFECTIVITY: ALL

050B

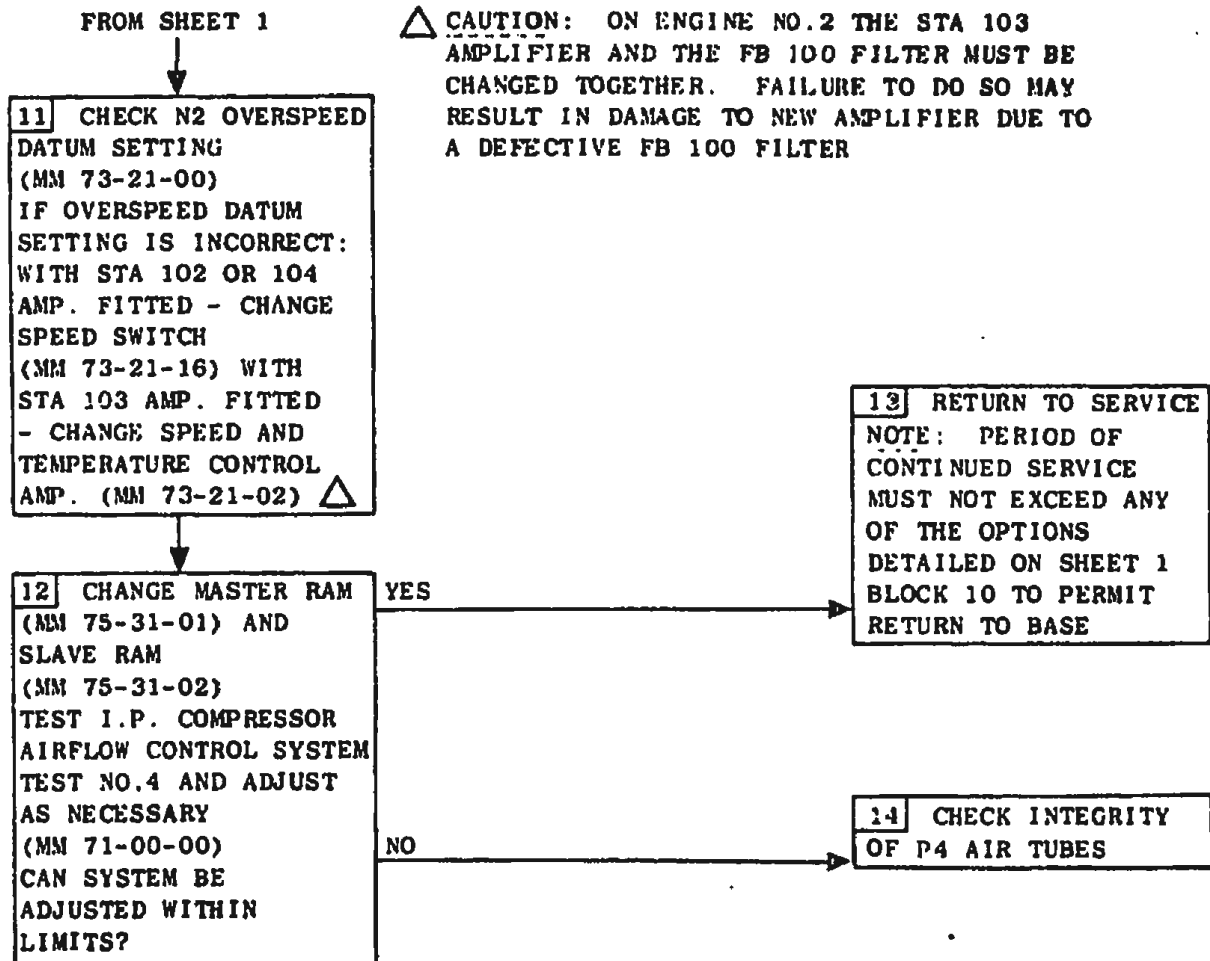
1A

71-86-00
Page 112
Dec 15/91



RB.211 Propulsion System

MAINTENANCE



30049A

N2 overspeed above 115%
Fig.107 (Sheet 2 of 2)

R
R
0508 EFFECTIVITY: ALL

1A

71-86-00
Page 113
Dec 15/95



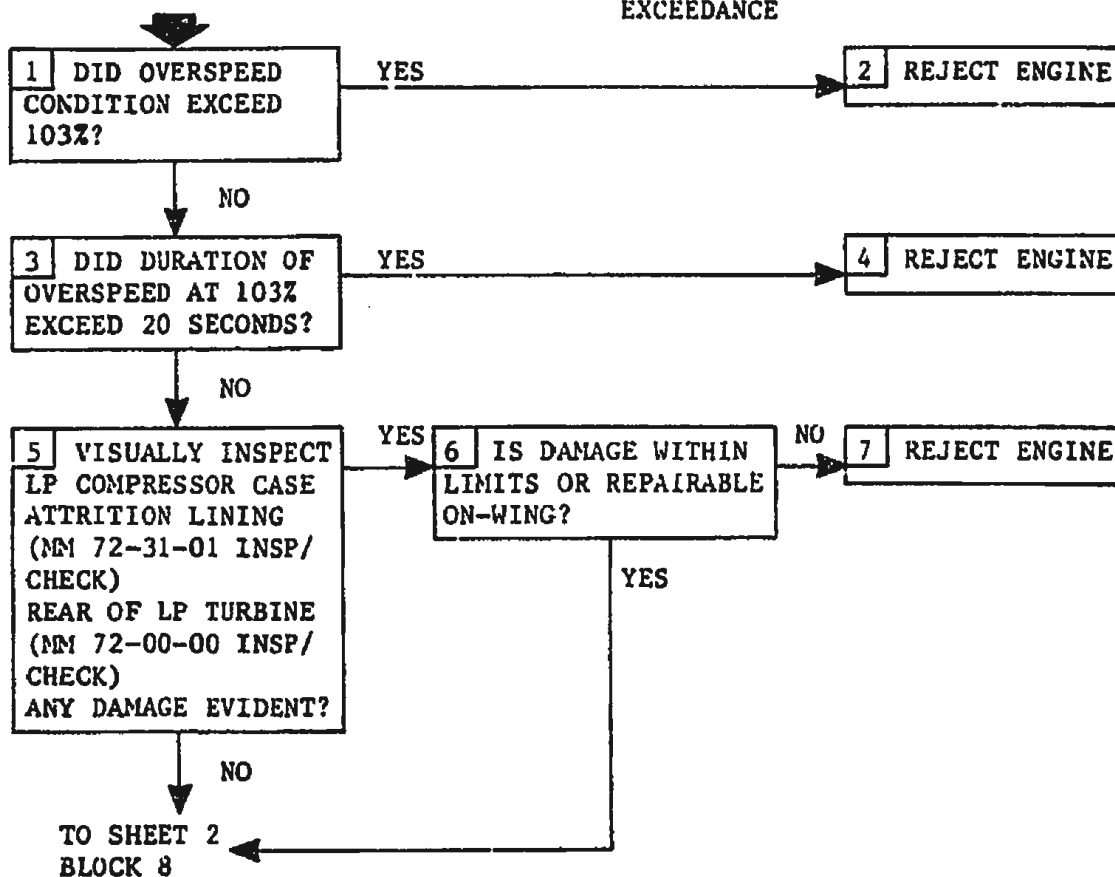
RB.211 Propulsion System

MAINTENANCE

N1 OVERSPEED ABOVE
101% UP TO AND
INCLUDING 103%

NOTE: IT IS NECESSARY TO HAVE THIS INFORMATION

- a. ALTITUDE AT WHICH EXCEEDANCE OCCURRED
- b. EXCEEDANCE AS A RESULT OF ANY FLIGHT CREW EMERGENCY PROCEDURE
- c. MODE OF ENGINE OPERATION DURING EXCEEDANCE



A2046

R
R

N1 overspeed above 101% up to and including 103%
Fig.108 (Sheet 1 of 4)

R
R

EFFECTIVITY: ALL

050B

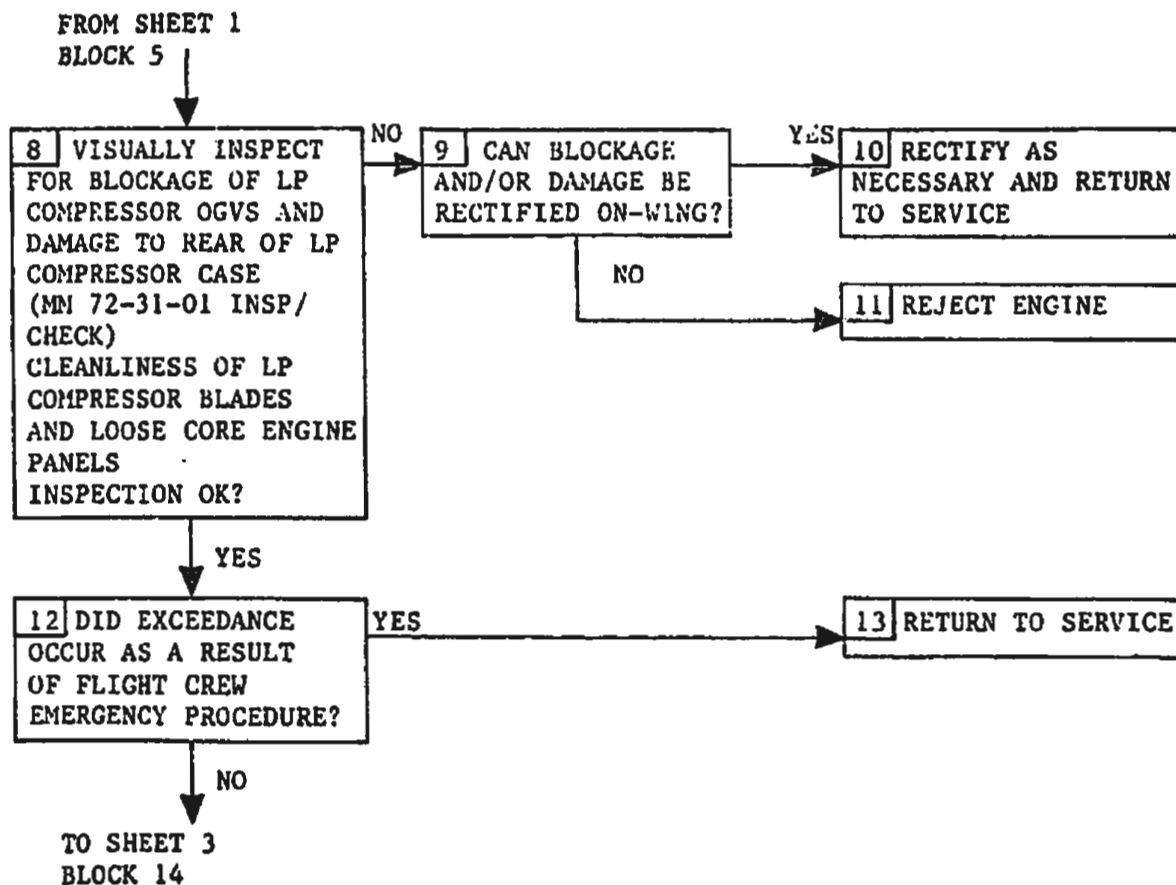
1A

71-86-00
Page 114
Dec 15/95



RB.211 Propulsion System

MAINTENANCE



A2048

R N1 overspeed above 101% up to and including 103%
R Fig.108 (Sheet 2 of 4)

R EFFECTIVITY: ALL
R

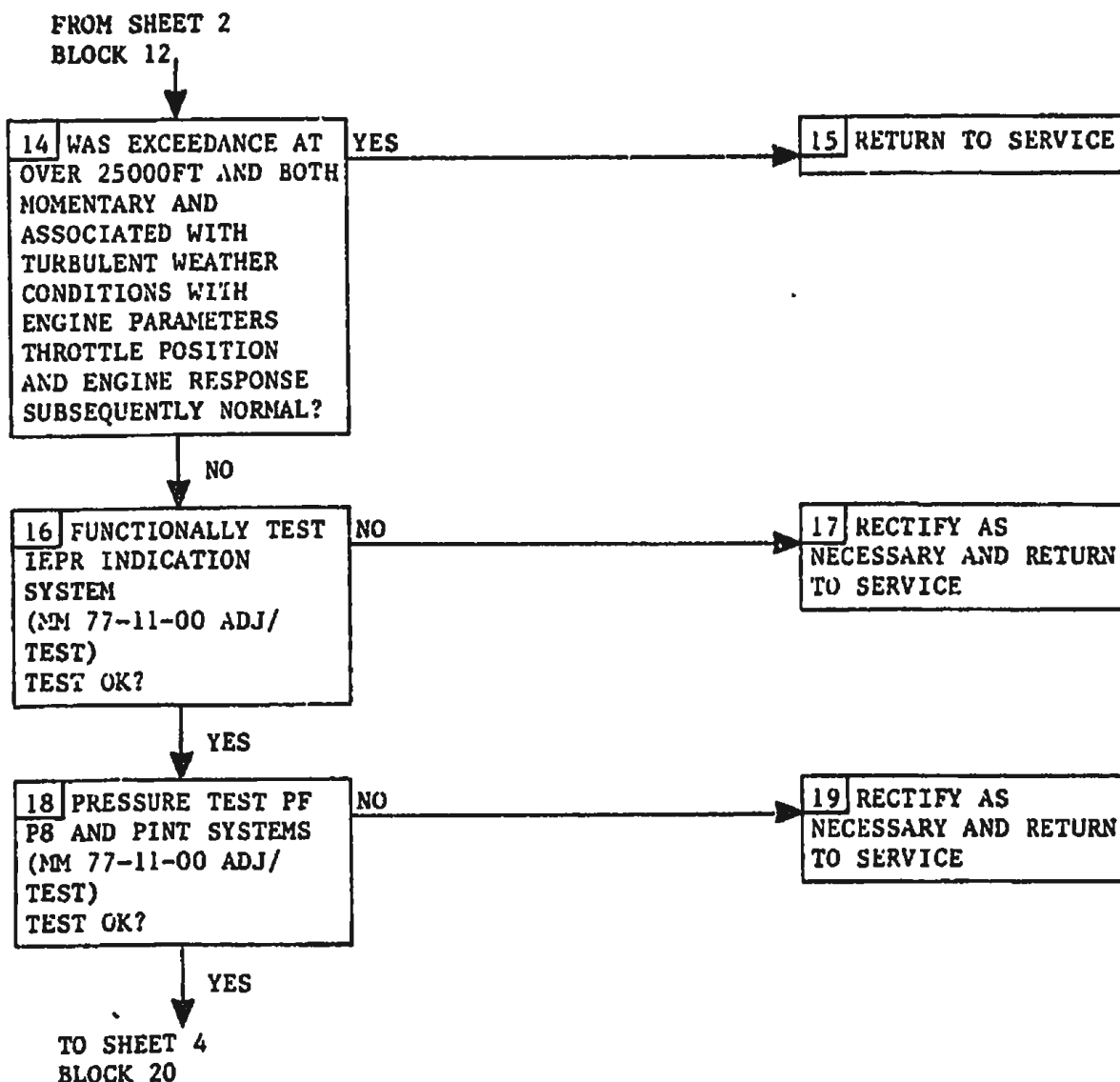
050B

1A

71-86-00
Page 115
Dec 15/95



RB.211 Propulsion System MAINTENANCE



A2083

R
R

N1 overspeed above 101% up to and including 103%
Fig.108 (Sheet 3 of 4)

R
R

EFFECTIVITY: ALL

050B

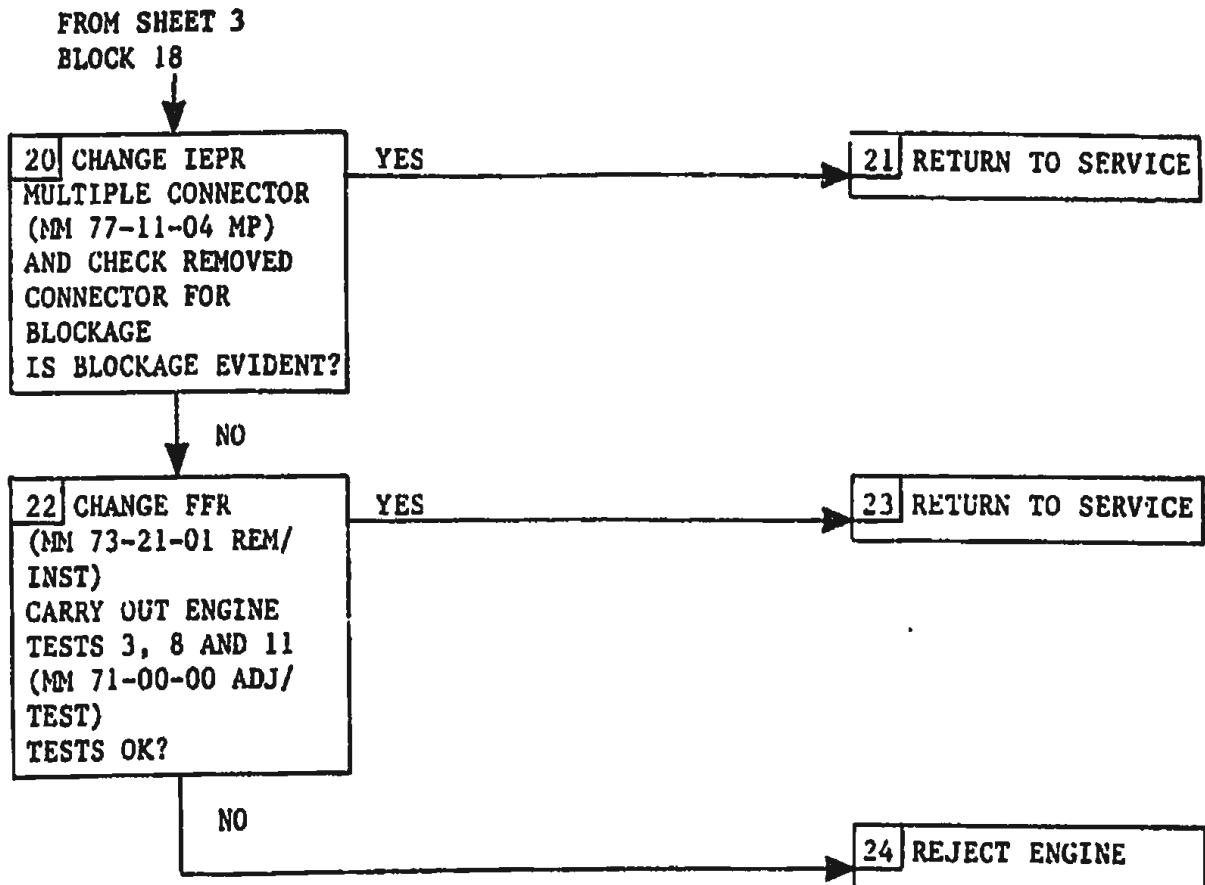
1A

71-86-00
Page 116
Dec 15/95



RB.211 Propulsion System

MAINTENANCE



A2084

R
R

N1 overspeed above 101% up to and including 103%
Fig.108 (Sheet 4 of 4)

R
R

EFFECTIVITY: ALL

050B

1A

71-86-00
Page 117/118
Dec 15/95



BB.211 Propulsion System

MAINTENANCE

TURBINE GAS TEMPERATURE (STARTING AND RELIGHTING) - FAULT ISOLATION

1. General

The diagrams and schematics in this section can be used for fault isolation any time a fault is reported or suspected. Uncommon abbreviations are defined on the using fault code diagram or schematic.

If the flight crew reports a fault using a fault code number, the code number can be found in the Fault Isolation Reference Table in the Chapter 71 Fault Code Index. The index specifies the exact maintenance manual section, fault isolation diagram, and block number on the diagram where the fault isolation procedure should start. Where applicable, schematics are included at the end of the section to supplement the fault code diagrams or as an aid in isolating a problem not covered on the diagrams.

Refer to the Maintenance Manual Introduction for a more detailed discussion of the Fault Isolation Reporting Method (FIRM) and use of fault isolation diagrams/schematics.

2. Fault Isolation/Identification

Table 101 lists the fault isolation diagrams and schematics in this section.

TABLE 101

FIGURE	TITLE
103	Engine lights-up, but maximum T.G.T. appears likely to be exceeded below 32% N3
104	Engine lights-up but maximum T.G.T. appears likely to be exceeded above 32% N3
105	Engine overtemperature above 550 deg.C. up to and including 600 deg.C.
106	Engine overtemperature above 600 deg.C. up to and including 725 deg.C.
107	Engine overtemperature above 725 deg.C.

R EFFECTIVITY: ALL

050B

1G

71-88-00

Page 101
May 15/87



RB.211 Propulsion System

MAINTENANCE

<u>COMPONENT</u>	<u>QTY</u>	<u>ACCESS/AREA</u>	<u>REFERENCE</u>
CONTROL UNIT - H.P.			
COMPRESSOR BLEED VALVE	3	ENGINE: 413A, 423A, 433AL	75-32-01
CONTROL UNIT - BLEED VALVE	3	ENGINE: 412BR, 422BR, 432BR	75-31-02
RAM - INTAKE GUIDE			
VANE SLAVE	3	ENGINE: 412BR, 422BR, 432BR	75-31-02
INDICATOR - N3	3	PILOTS MAIN INSTRUMENT PANEL - 210	77-12-08
PUMP - COMBINED FUEL	3	ENGINE: 413A, 423A, 433AL	73-11-01
REGULATOR - STARTING FUEL FLOW	3	ENGINE: 413A, 423A, 433AL	73-21-03

Component Location Index
Fig.101

R
R
050B

EFFECTIVITY: ALL

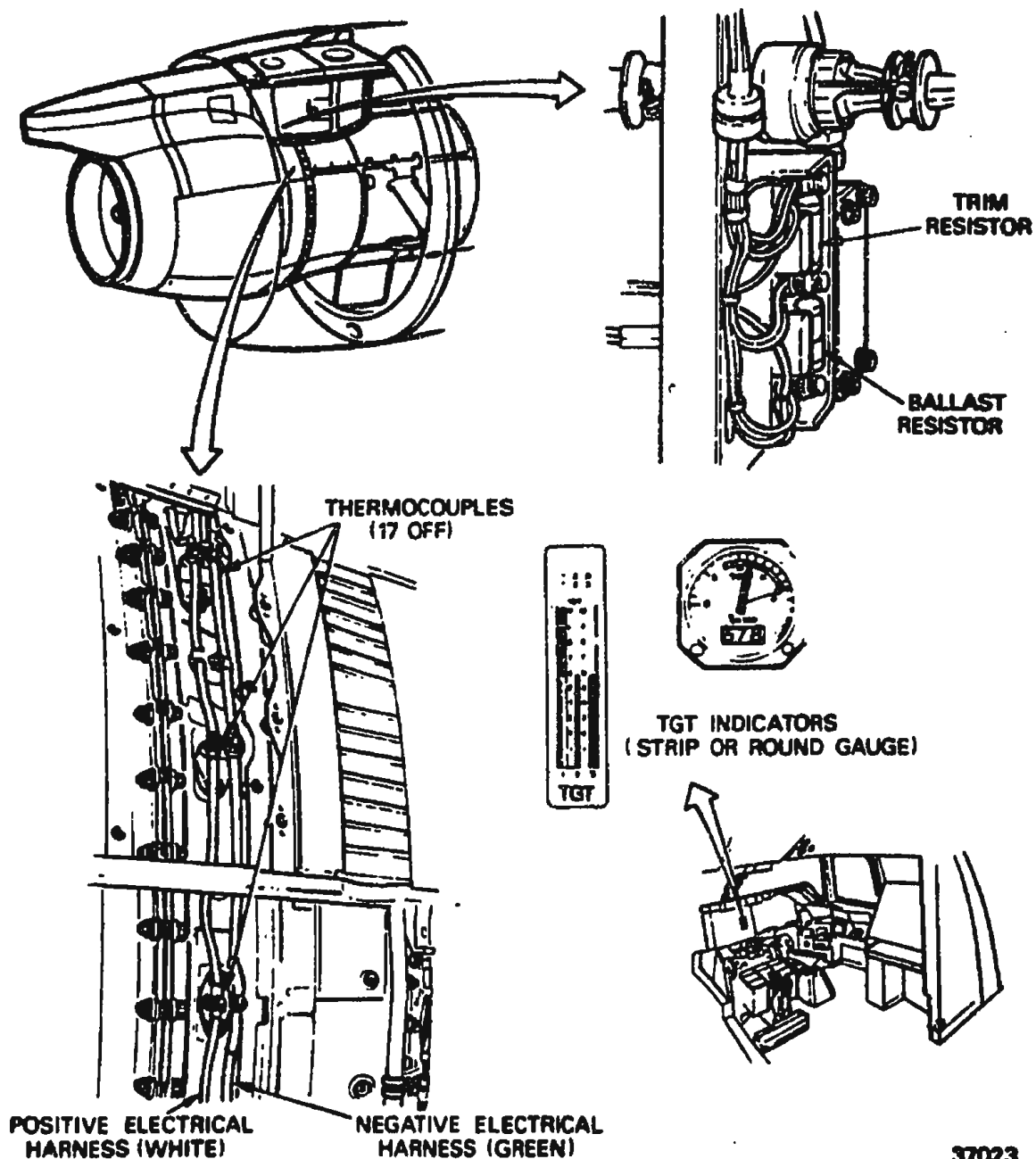
1G

71-88-00
Page 102
May 15/87



RB.211 Propulsion System

MAINTENANCE



Component Locator Diagram
Fig.102

EFFECTIVITY: ALL

71-88-00

Page 103
Mar 15/81

1A

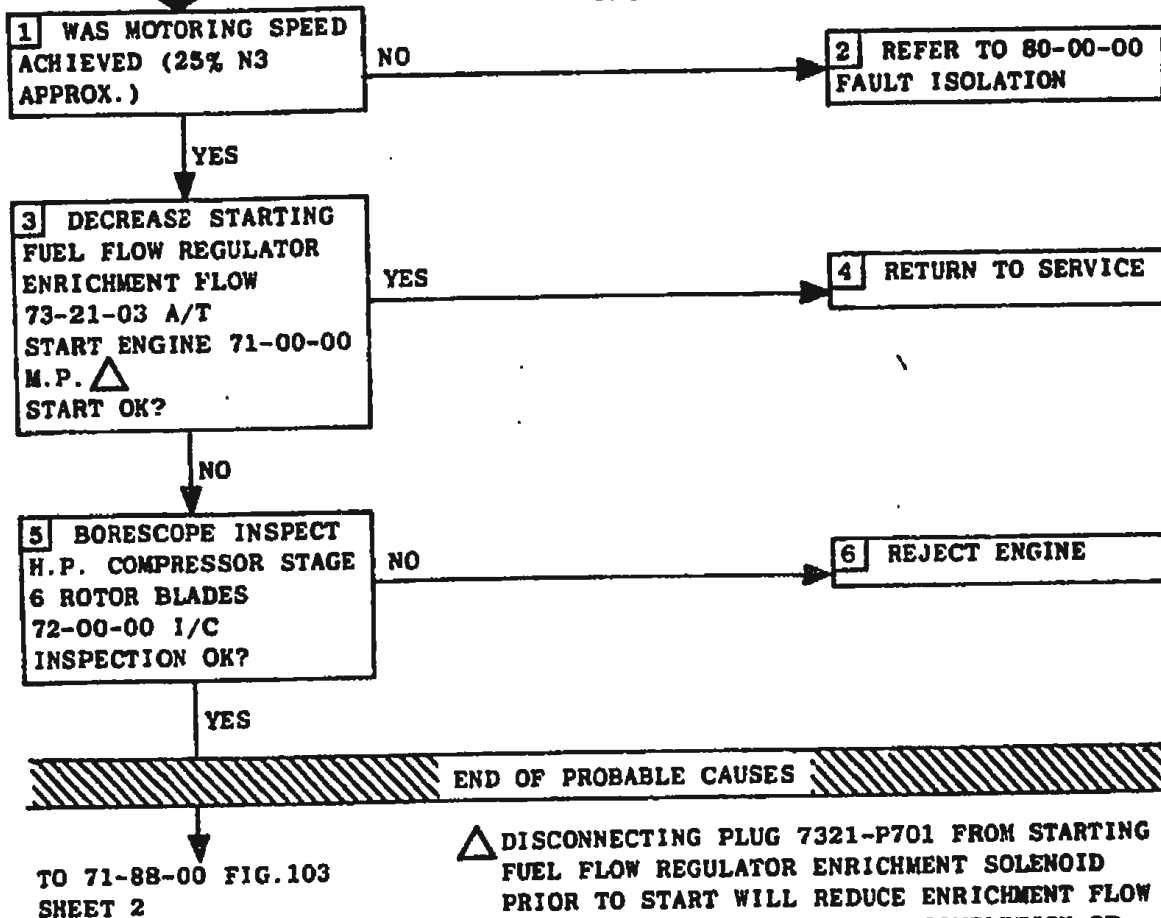


RB.211 Propulsion System

MAINTENANCE

ENGINE LIGHTS-UP BUT
MAX. T.G.T. APPEARS
LIKELY TO BE EXCEEDED
BELOW 32% N3

CAUTION: IF HOT START EXPERIENCED FOLLOWING
ACTUAL OR SUSPECTED BIRD STRIKE,
BORESCOPE INSPECT COMBUSTION LINER
AND H.P. COMPRESSOR STAGE 1
72-00-00 1/C BEFORE EFFECTING
PROCEDURE ON THIS CHART.



DISCONNECTING PLUG 7321-P701 FROM STARTING FUEL FLOW REGULATOR ENRICHMENT SOLENOID PRIOR TO START WILL REDUCE ENRICHMENT FLOW TO ZERO. CONNECT PLUG ON COMPLETION OF START. IF THIS PROCEDURE IS USED TO EFFECT ENGINE START, BORESCOPE INSPECT HP COMPRESSOR STAGE 6 AT FIRST OPPORTUNITY.

48702A

R
R
R

Engine lights-up, but maximum T.G.T. appears likely to
be exceeded below 32% N3
Fig.103 (Sheet 1 of 2)

EFFECTIVITY: ALL

050B

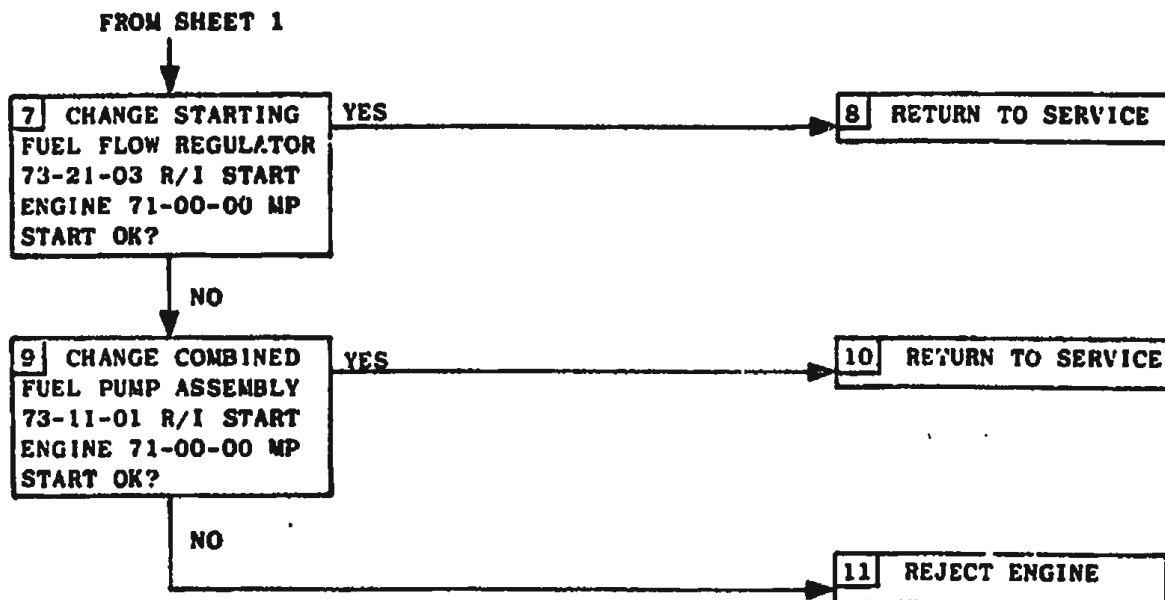
1G

71-88-00
Page 104
Mar 15/83



RB.211 Propulsion System

MAINTENANCE



48703

R
R
R

Engine lights-up, but maximum T.G.T. appears likely to be exceeded below 32% N3
Fig.103 (Sheet 2 of 2)

EFFECTIVITY: ALL

050B

1G

71-88-00
Page 105
Feb 15/82

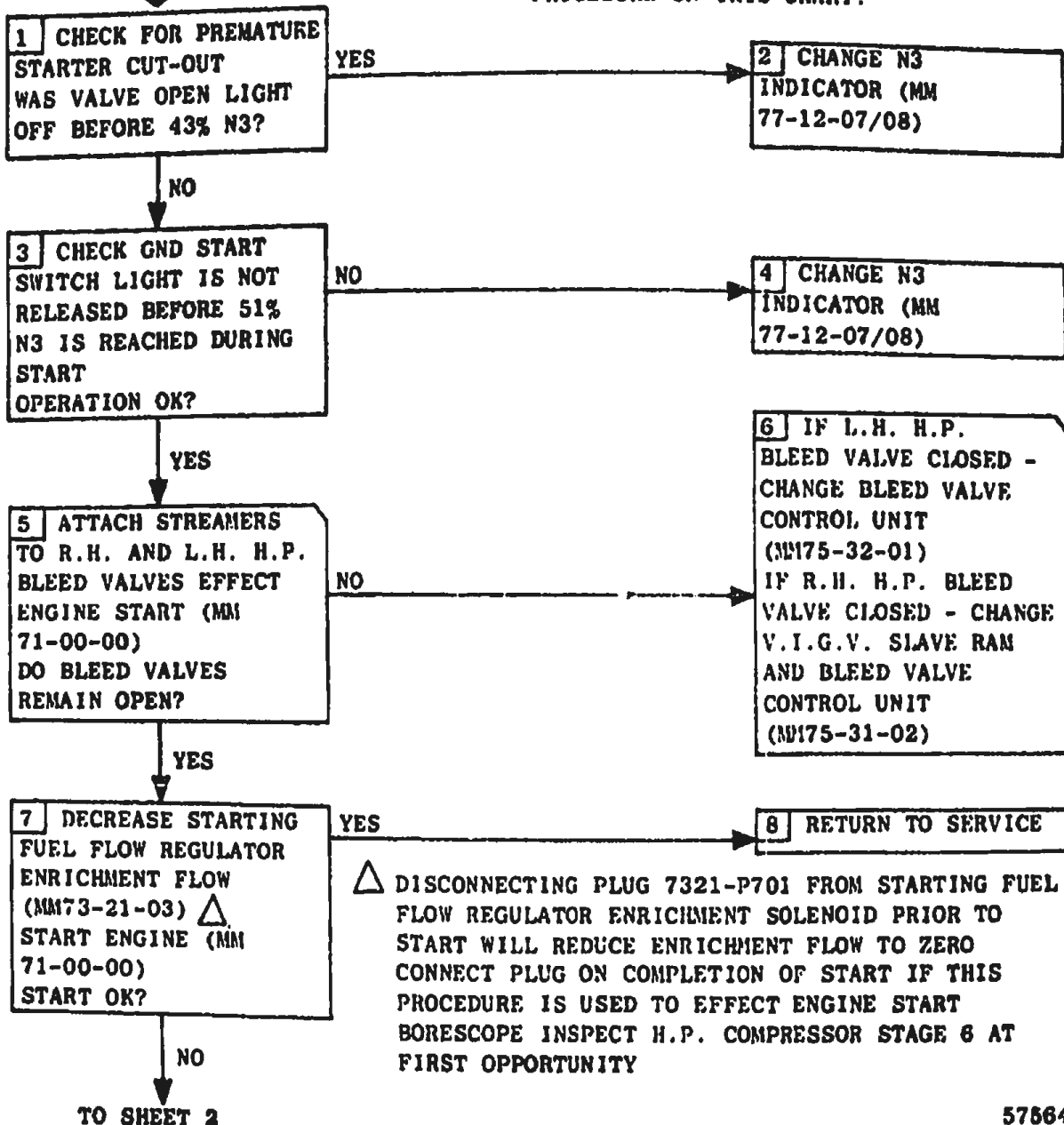


RB.211 Propulsion System

MAINTENANCE

ENGINE LIGHTS-UP BUT
MAX. T.G.T. APPEARS
LIKELY TO BE EXCEEDED
ABOVE 32% N3

CAUTION: IF HOT START EXPERIENCED FOLLOWING
ACTUAL OR SUSPECTED BIRD STRIKE,
BORESCOPE INSPECT COMBUSTION LINER
AND H.P. COMPRESSOR STAGE 1
72-00-00 1/C BEFORE EFFECTING
PROCEDURE ON THIS CHART.



57564

CR
CR
CR

Engine lights-up, but maximum T.G.T. appears likely to
be exceeded above 32% N3
Fig.104 (Sheet 1 of 2)

EFFECTIVITY: ALL

050B

16

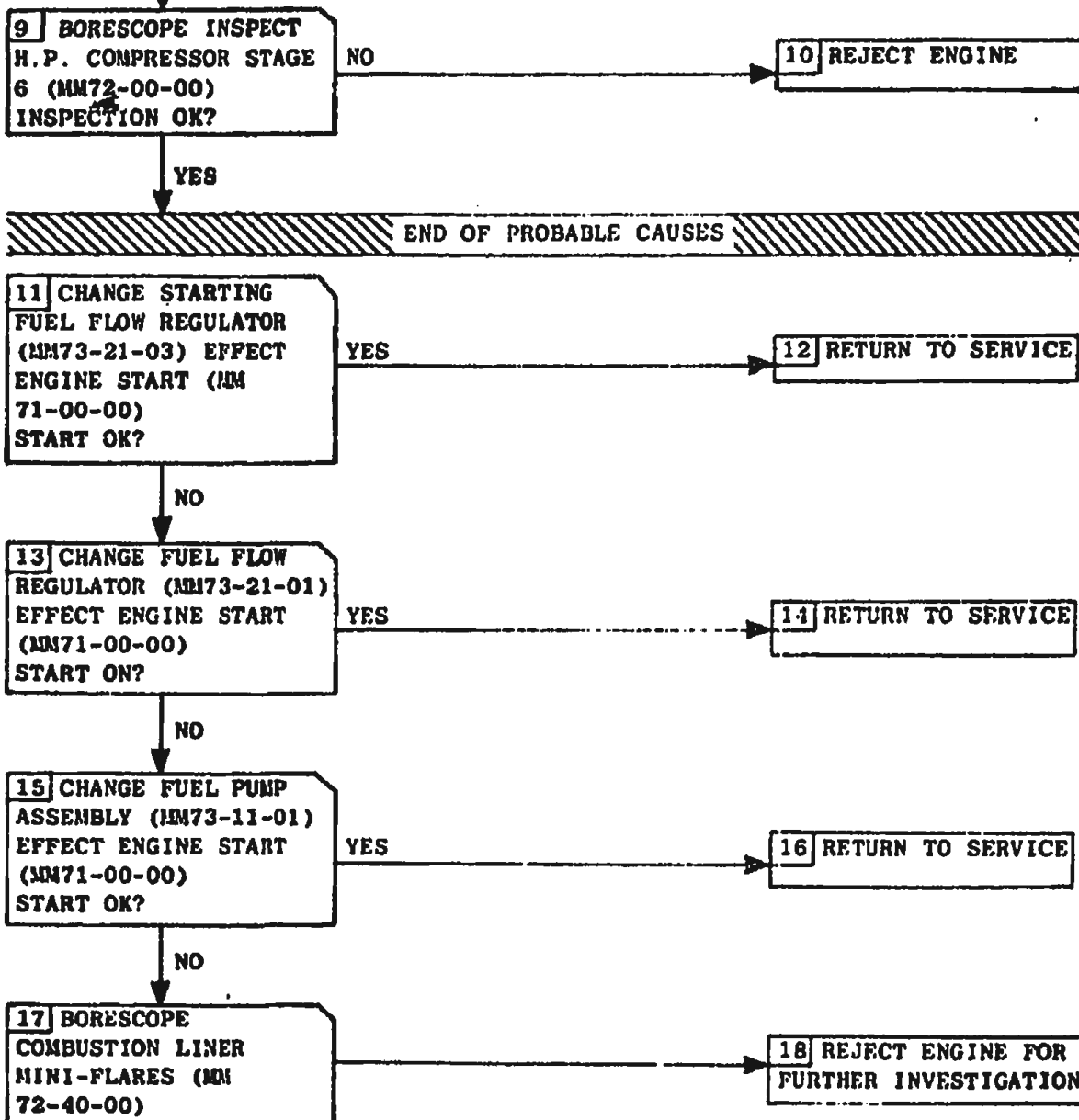
71-88-00

Page 106
Jul 15/84



RB.211 Propulsion System MAINTENANCE

FROM SHEET 1



45547A

CR
CR
CR

Engine lights-up, but maximum T.G.T. appears likely to
be exceeded above 32% N3
Fig.104 (Sheet 2 of 2)

EFFECTIVITY: ALL

050B

1G

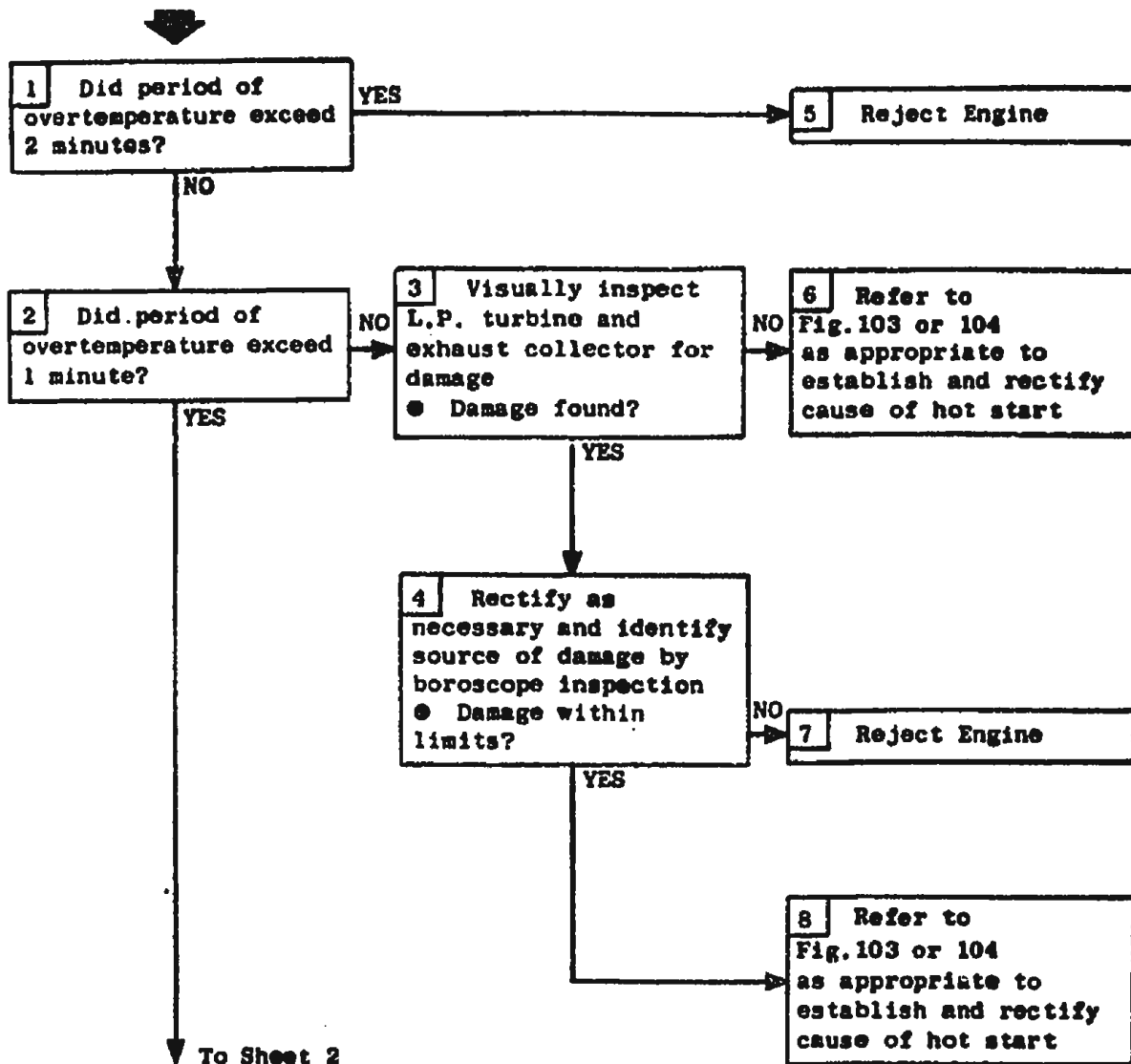
71-88-00
Page 107
Jul 15/84



RB.211 Propulsion System

MAINTENANCE

Overtemperature (starting and relighting) above 550 deg.C.
up to and including 600 deg.C.



37484A

Engine overtemperature above 550 deg.C.
up to and including 600 deg.C.
Fig.105 (Sheet 1 of 2)

R
R
050B

EFFECTIVITY: ALL

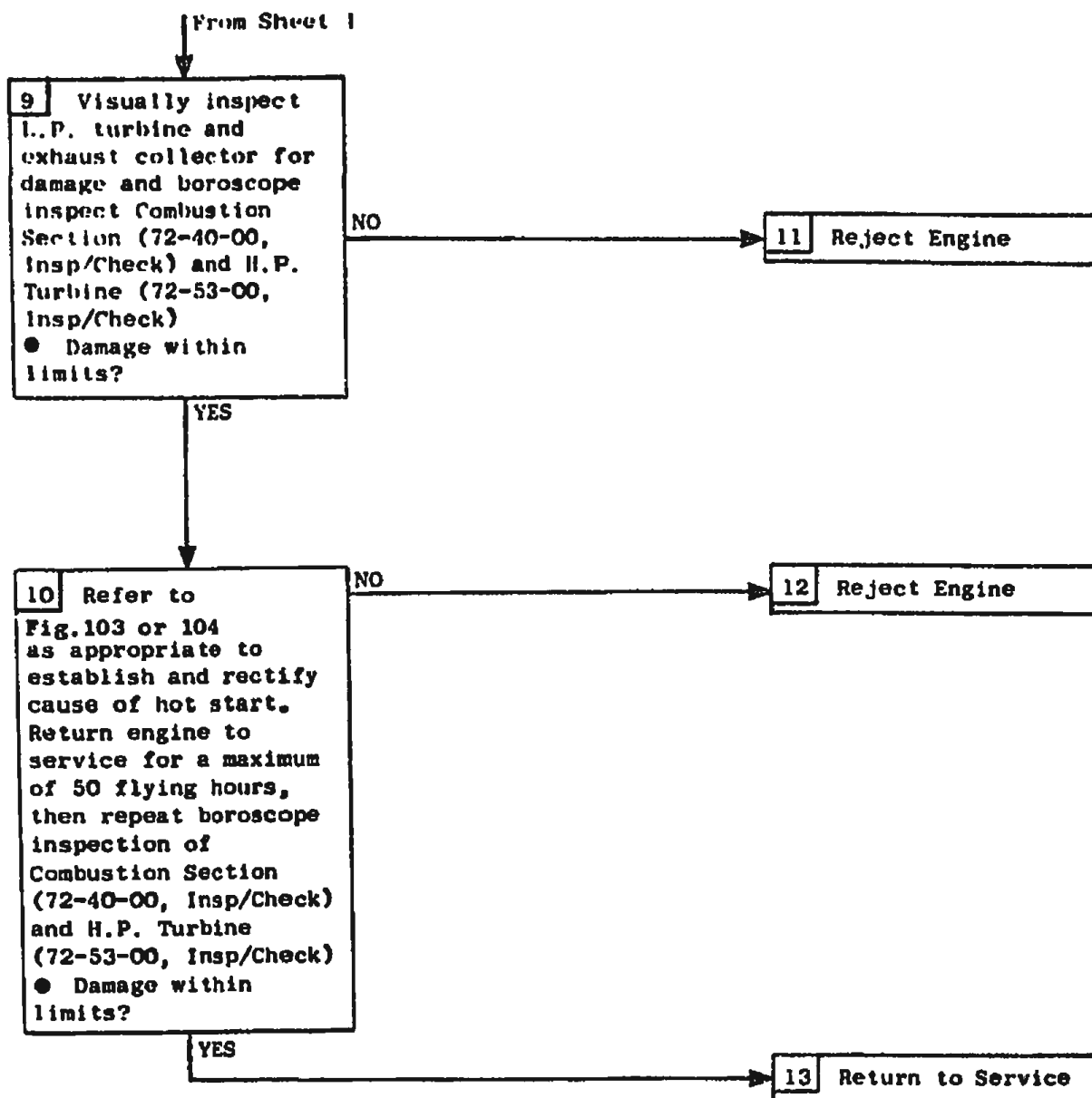
1G

71-88-00
Page 108
Feb 15/82



RB.211 Propulsion System

MAINTENANCE



374B5A

Engine overtemperature above 550 deg.C.
up to and including 600 deg.C.
Fig.105 (Sheet 2 of 2)

R
R
050B

EFFECTIVITY: ALL

1G

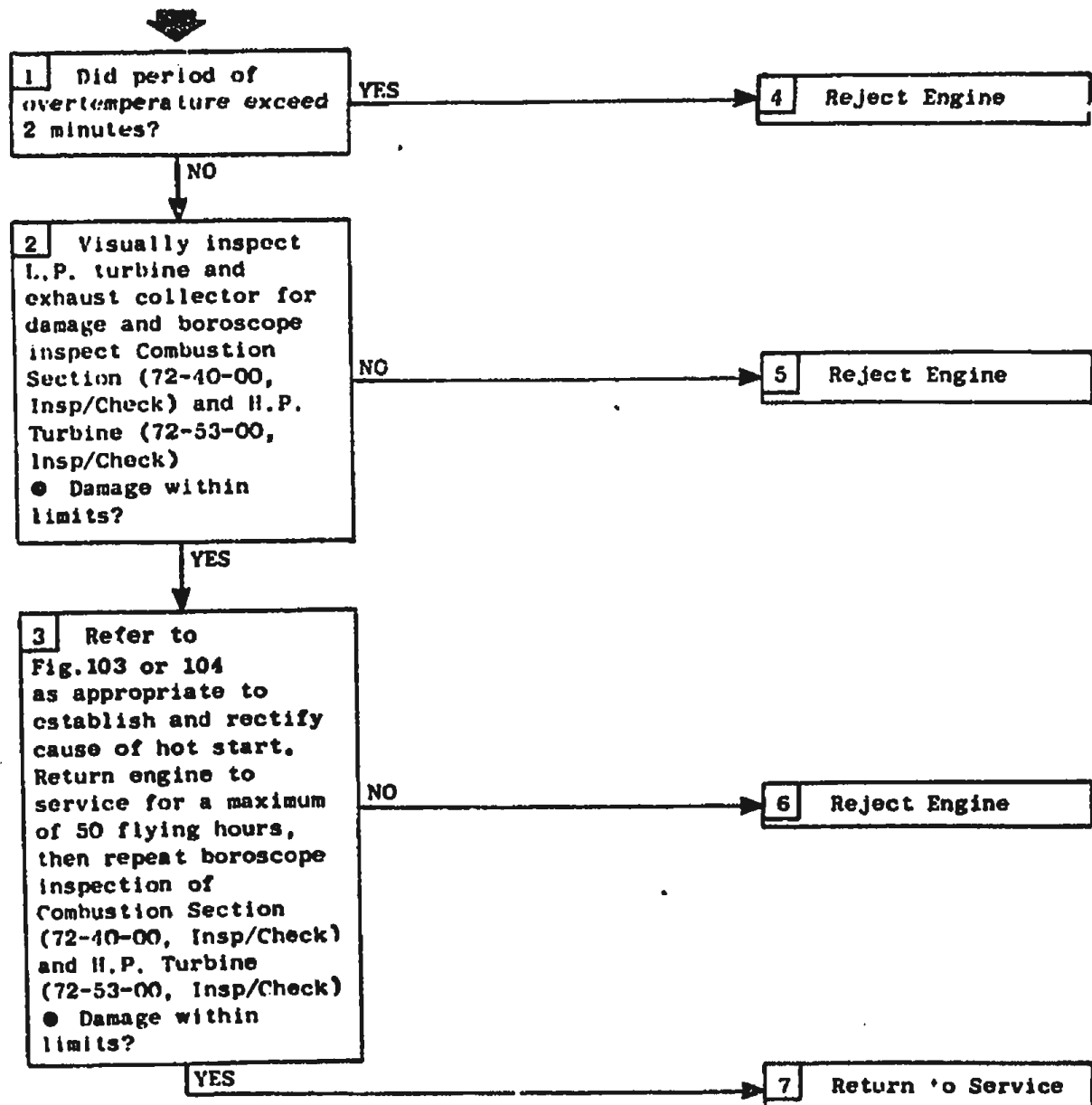
71-88-00
Page 109
Feb 15/82



RB.211 Propulsion System

MAINTENANCE

Overtemperature (starting and relighting) above 600 deg.C.
up to and including 725 deg.C.



37486A

Engine overtemperature above 600 deg.C.
up to and including 725 deg.C.
Fig.106

EFFECTIVITY: ALL

71-88-00
Page 110
Mar 15/81

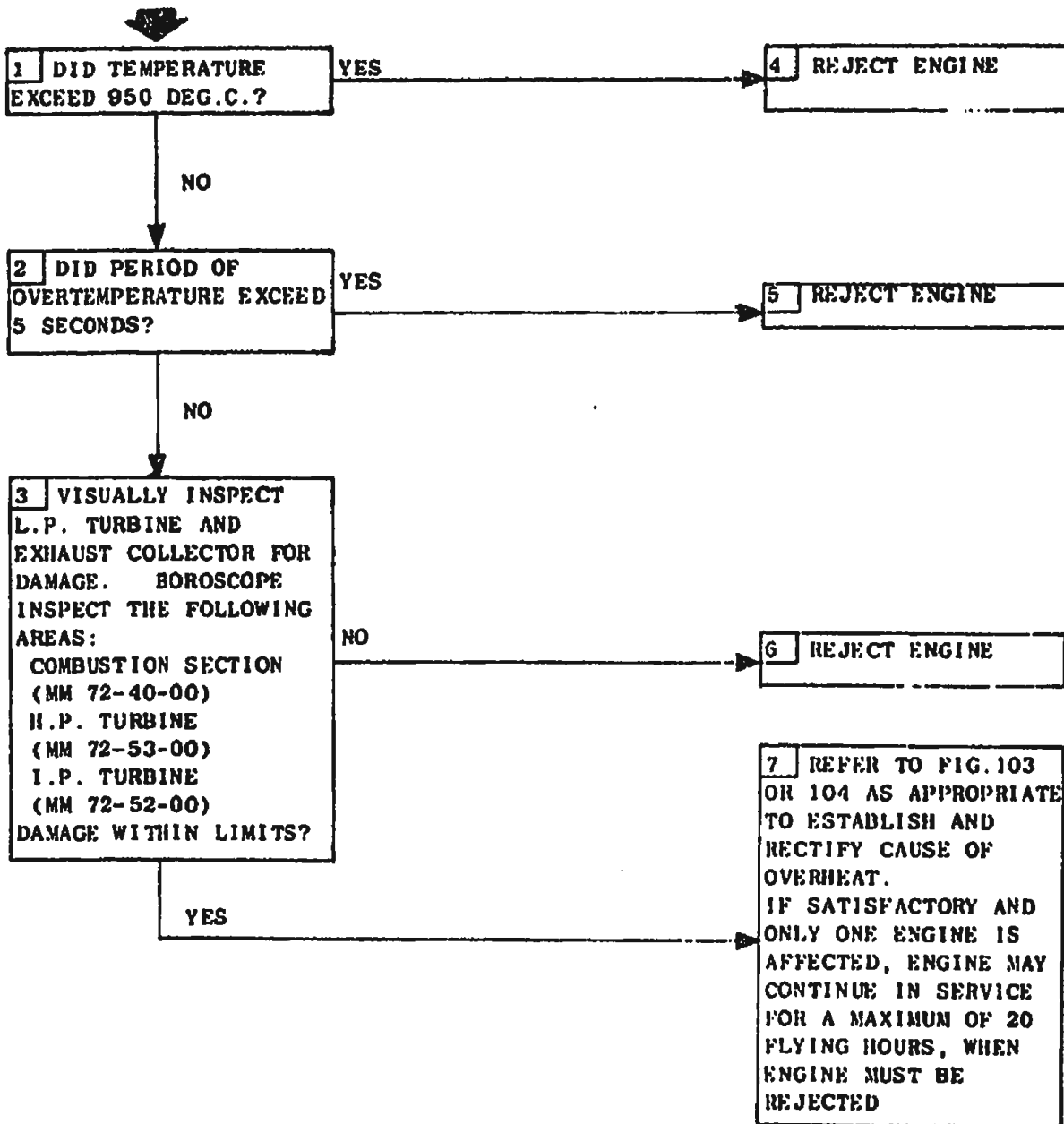
1A

R
R
R
R
050B



RB.211 Propulsion System MAINTENANCE

OVERTEMPERATURE (STARTING AND
RELIGHTING) ABOVE 725 DEG.C.



37487B

R
R

Engine overtemperature above 725 deg.C.
Fig.107

EFFECTIVITY: ALL

050B

1G

71-88-00
Page 111/112
May 15/87



RB.211 Propulsion System

MAINTENANCE

C TURBINE GAS TEMPERATURE (STARTING AND RELIGHTING) -
C MAINTENANCE PRACTICES

CR 1. RB-211 Hot Starts - DELETED

R
R
050B

EFFECTIVITY: ALL

1G

71-88-00
Page 201/202
Nov 15/88



RB.211 Propulsion System

MAINTENANCE

TURBINE GAS TEMPERATURE (NOT STARTING AND RELIGHTING) - FAULT ISOLATION

1. General

The diagrams and schematics in this section can be used for fault isolation any time a fault is reported or suspected. Uncommon abbreviations are defined on the using fault code diagram or schematic.

If the flight crew reports a trouble using a fault code number, the code number can be found in the Fault Isolation Reference Table in the Chapter 71 Fault Code Index. The index specifies the exact maintenance manual section, fault isolation diagram, and block number on the diagram where the fault isolation procedure should start. Where applicable, schematics are included at the end of the section to supplement the fault code diagrams or as an aid in isolating a problem not covered on the diagrams.

Refer to the Maintenance Manual Introduction for a more detailed discussion of the Fault Isolation Reporting Method (FIRM) and use of fault isolation diagrams/schematics.

2. Fault Isolation/Identification

Table 101 lists the fault isolation diagrams and schematics in this section.



RB.211 Propulsion System

MAINTENANCE

TABLE 101

FIGURE	TITLE
103 Sheet 1	Engine overtemperature above 700 deg.C. up to and including 710 deg.C.
103 Sheet 2	Engine overtemperature above 710 deg.C. up to and including 728 deg.C.
104 Sheet 1	Engine overtemperature above 728 deg.C. up to and including 738 deg.C.
104 Sheet 2	Engine overtemperature above 738 deg.C. up to and including 743 deg.C.
104 Sheet 3	Engine overtemperature above 743 deg.C. up to and including 750 deg.C.
105 Sheet 1	Engine overtemperature above 750 deg.C. up to and including 780 deg.C.
105 Sheet 2	Engine overtemperature above 750 deg.C. up to and including 780 deg.C. plotting graph
106	Engine overtemperature above 780 deg.C.
107	T.G.T. indication reads low/zero
108	High T.G.T. - all other indications normal
109	High T.G.T. and fuel flow at an E.P.R.

R

EFFECTIVITY: ALL

050B

1A

71-89-00
Page 102
Mar 15/91



RB.211 Propulsion System

MAINTENANCE

<u>COMPONENT</u>	<u>QTY</u>	<u>ACCESS/AREA</u>	<u>REFERENCE</u>
HARNESS - THERMOCOUPLE	3	ENGINE: 412, 422, 432	77-21-05
INDICATOR - T.G.T.	3	PILOTS MAIN INST PANEL 210	77-21-03
RESISTOR - BALLAST	3	ENGINE: 418BR, 428BR, 438BR	77-21-04
RESISTOR - TRIM	3	ENGINE: 418BR, 428BR, 438BR	77-21-04
THERMOCOUPLE - T.G.T.	51	ENGINE: 412, 422, 432	77-21-01

Component Location Index
Fig.101

R
R
050B

EFFECTIVITY: ALL

1A

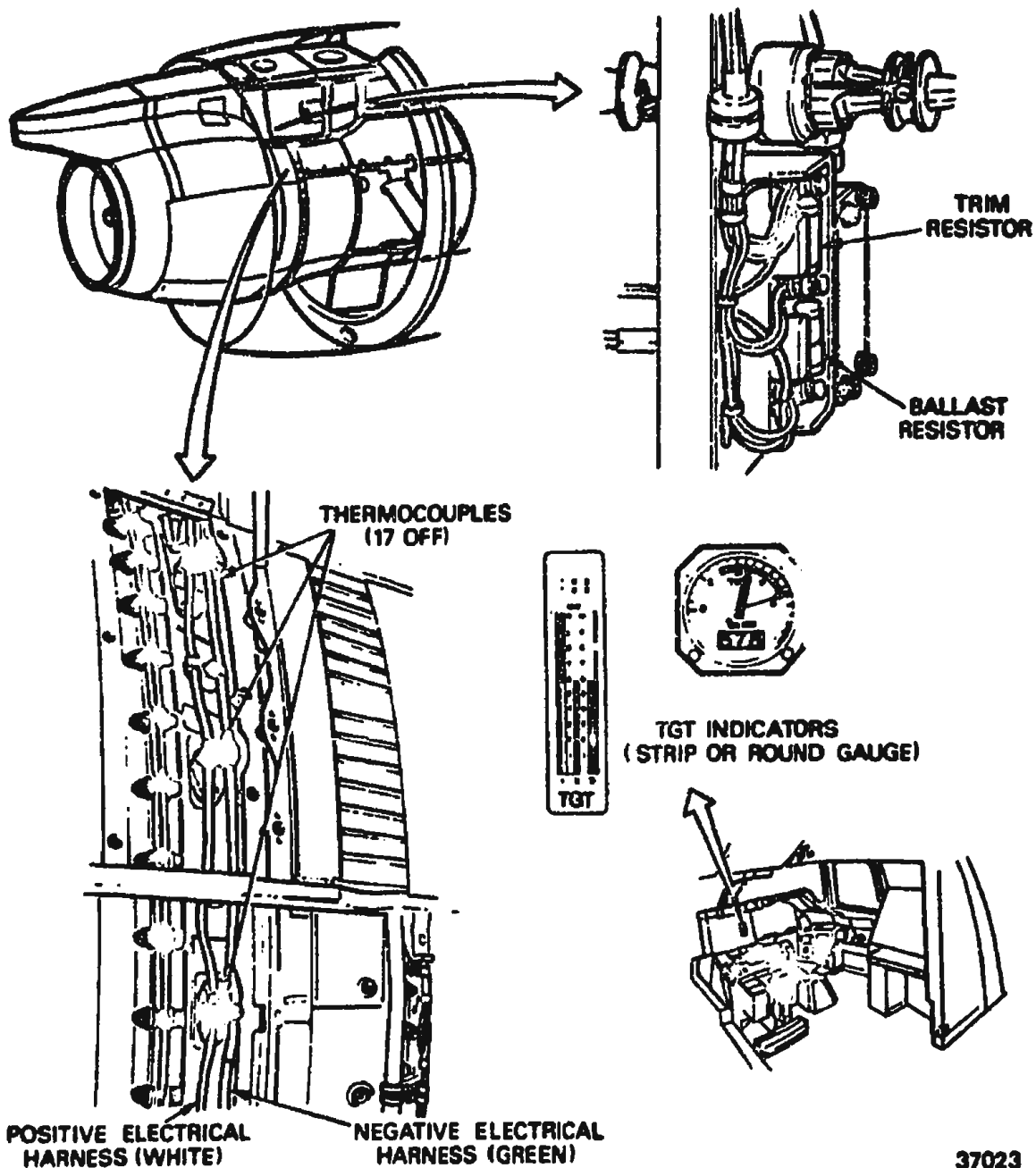
71-89-00

Page 103
May 15/87



RB.211 Propulsion System

MAINTENANCE



37023

Component Locator Diagram
Fig.102

R
R
050B

EFFECTIVITY: ALL

1A

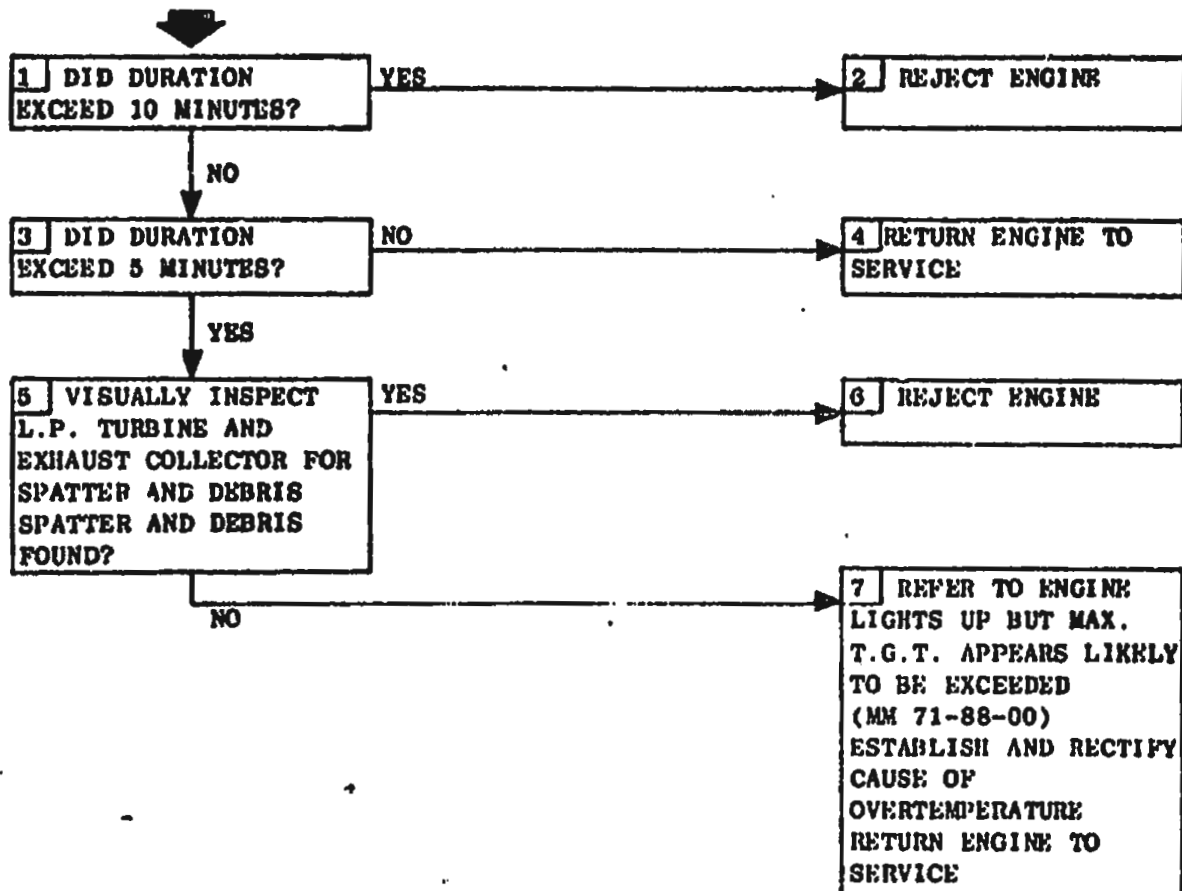
71-89-00

Page 104
May 15/87



RB.211 Propulsion System MAINTENANCE

OVERTEMPERATURE ABOVE 700 DEG.C.
UP TO AN INCLUDING 710 DEG.C.



38633C

Engine overtemperature above 700 deg.C.
up to and including 710 deg.C.
Fig.103 (Sheet 1 of 3)

R
R
R

EFFECTIVITY: ALL

0508

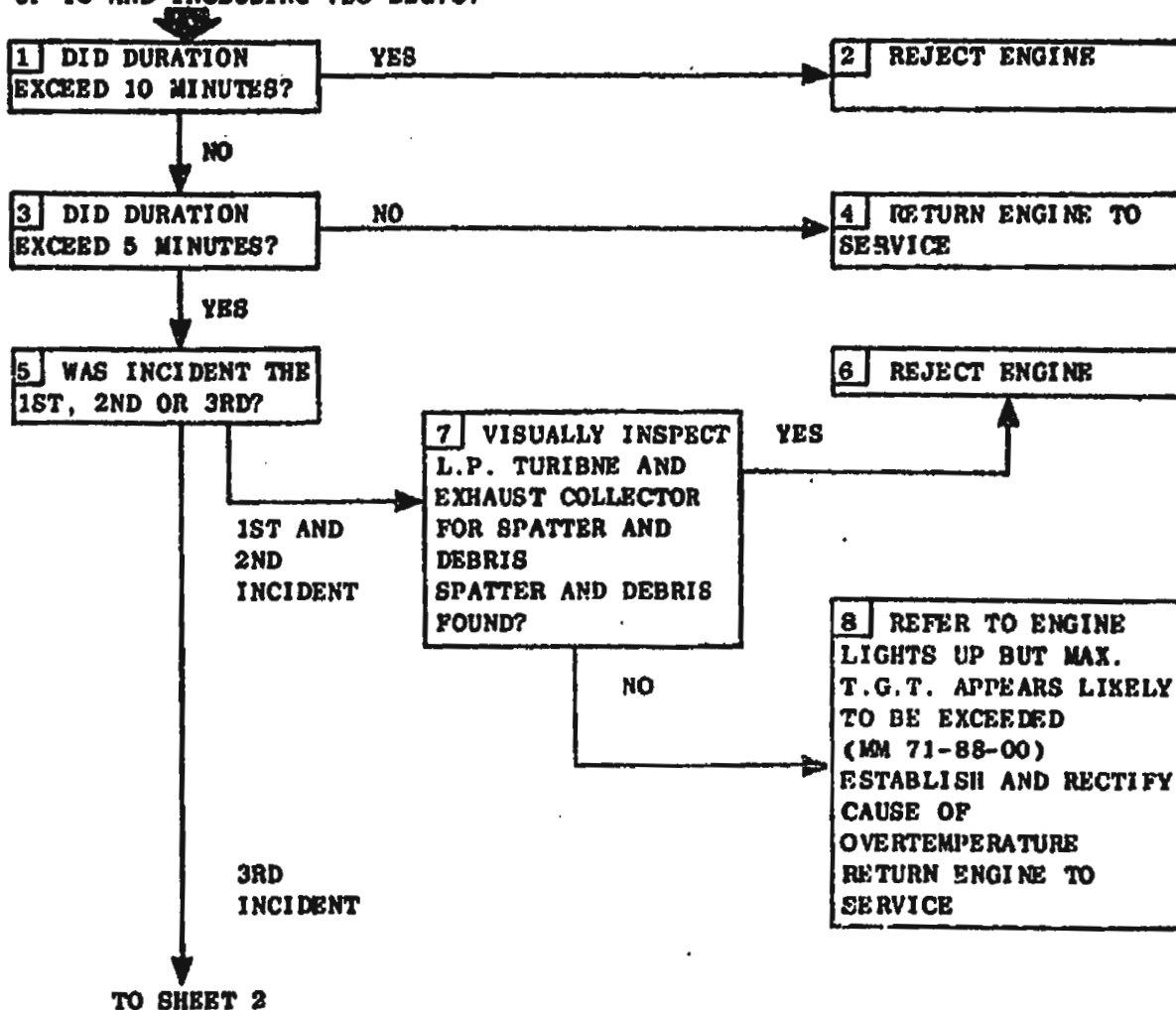
1A

71-89-00
Page 105
Nov 15/89



RB.211 Propulsion System MAINTENANCE

OVERTEMPERATURE ABOVE 710 DEG.C.
UP TO AND INCLUDING 728 DEG.C.



36834C

R
R
R

Engine overtemperature above 710 deg.C.
up to and including 728 deg.C.
Fig.103 (Sheet 2 of 3)

EFFECTIVITY: ALL

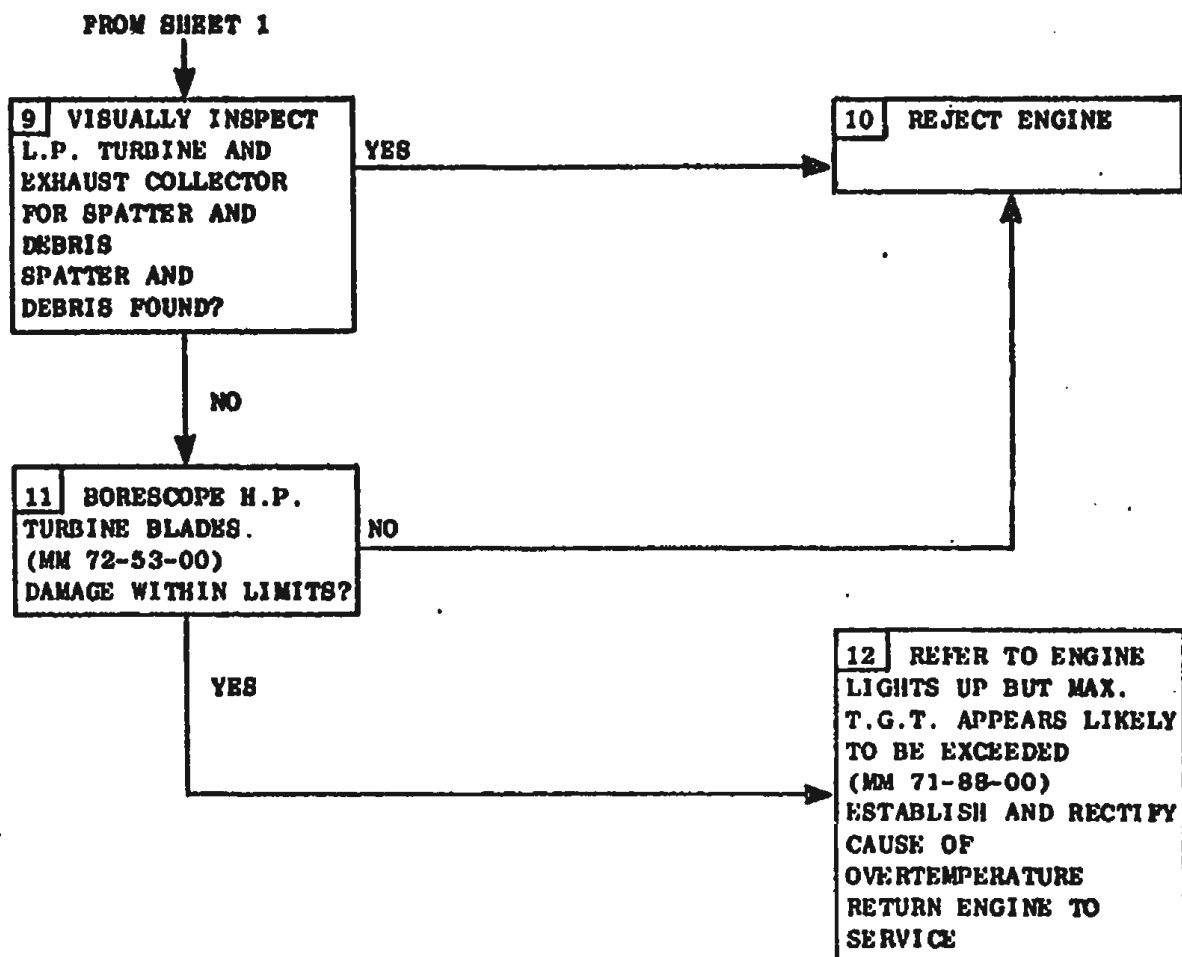
050B

1A

71-89-00
Page 106
Nov. 15/89



RB.211 Propulsion System MAINTENANCE



79745

R
R
R

Engine overtemperature above 710 deg.C.
up to and including 728 deg.C.
Fig.103 (Sheet 3 of 3)

EFFECTIVITY: ALL

050B

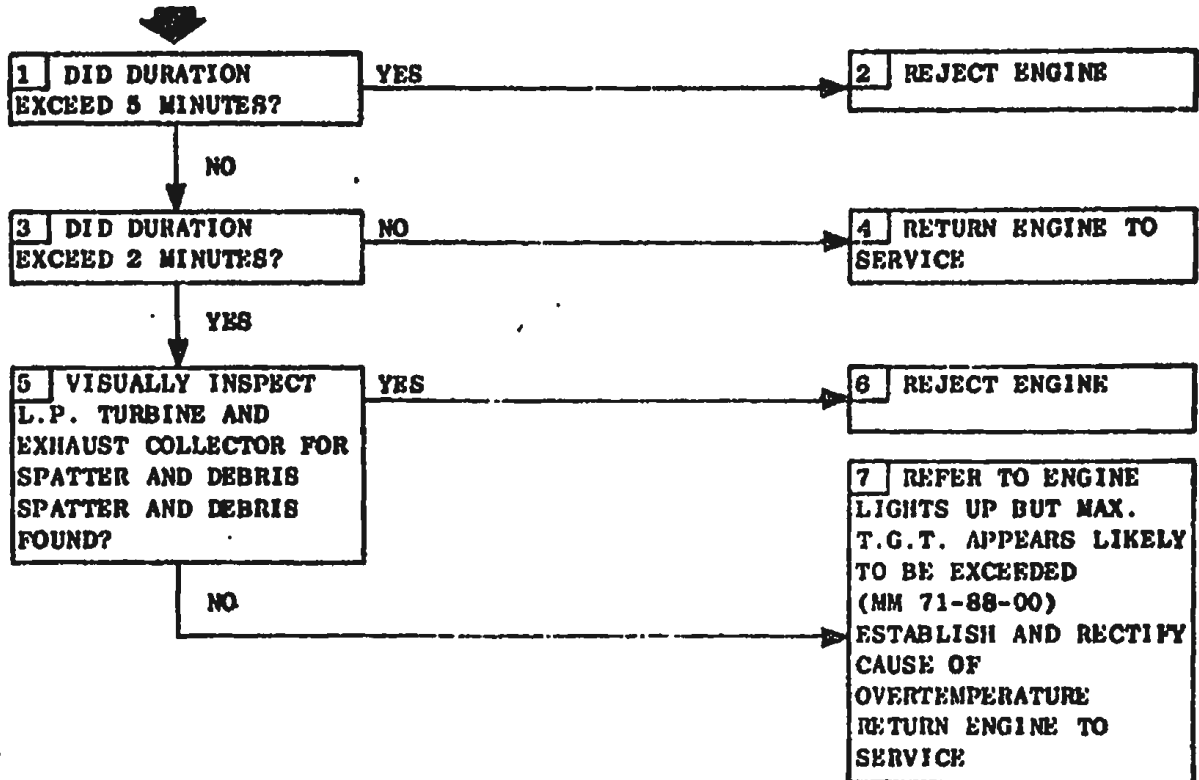
1A

71-89-00
Page 107
Nov 15/89



RB.211 Propulsion System MAINTENANCE

OVERTEMPERATURE ABOVE 728 DEG.C.
UP TO AND INCLUDING 738 DEG.C.



70726A

Engine overtemperature above 728 deg.C.
up to and including 738 deg.C.
Fig.104 (Sheet 1 of 4)

R
R
R

EFFECTIVITY: ALL

050B

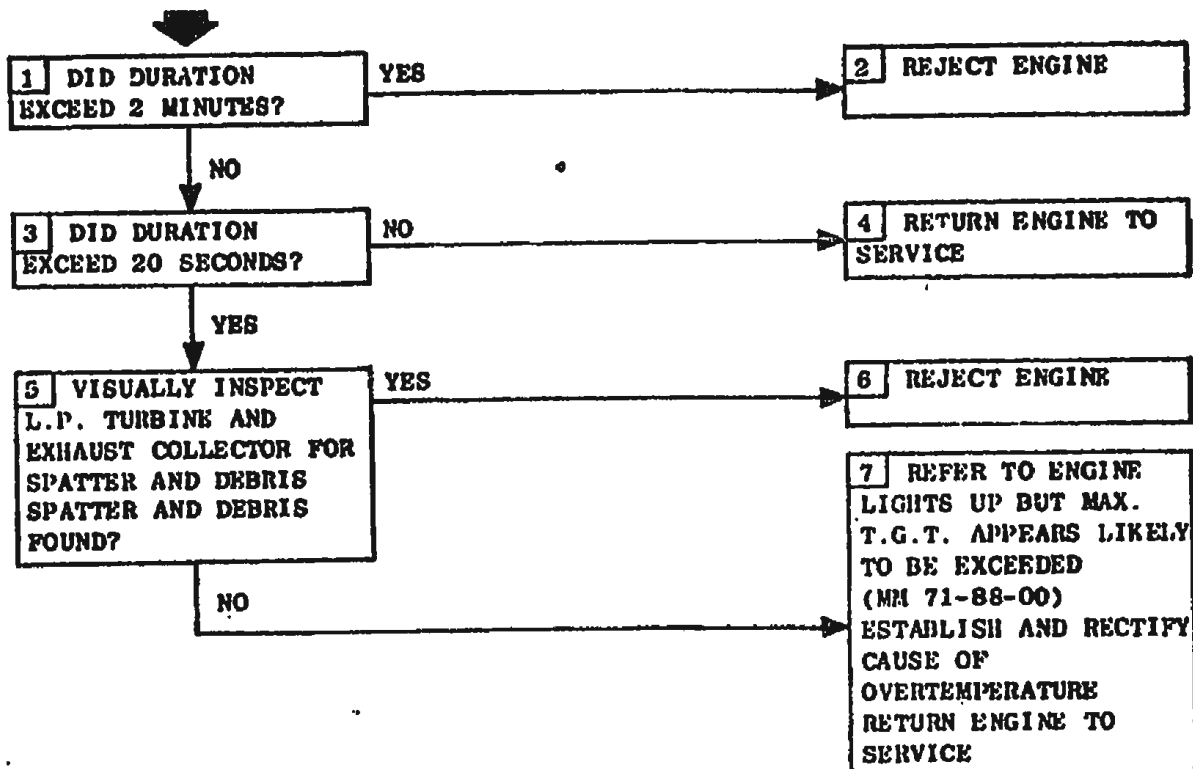
1A

71-89-00
Page 108
Nov 15/89



RB.211 Propulsion System MAINTENANCE

OVERTEMPERATURE ABOVE 738 DEG.C.
UP TO AND INCLUDING 743 DEG.C.



79727A

Engine overtemperature above 738 deg.C.
up to and including 743 deg.C.
Fig.104 (Sheet 2 of 4)

R
R
R

EFFECTIVITY: ALL

050B

1A

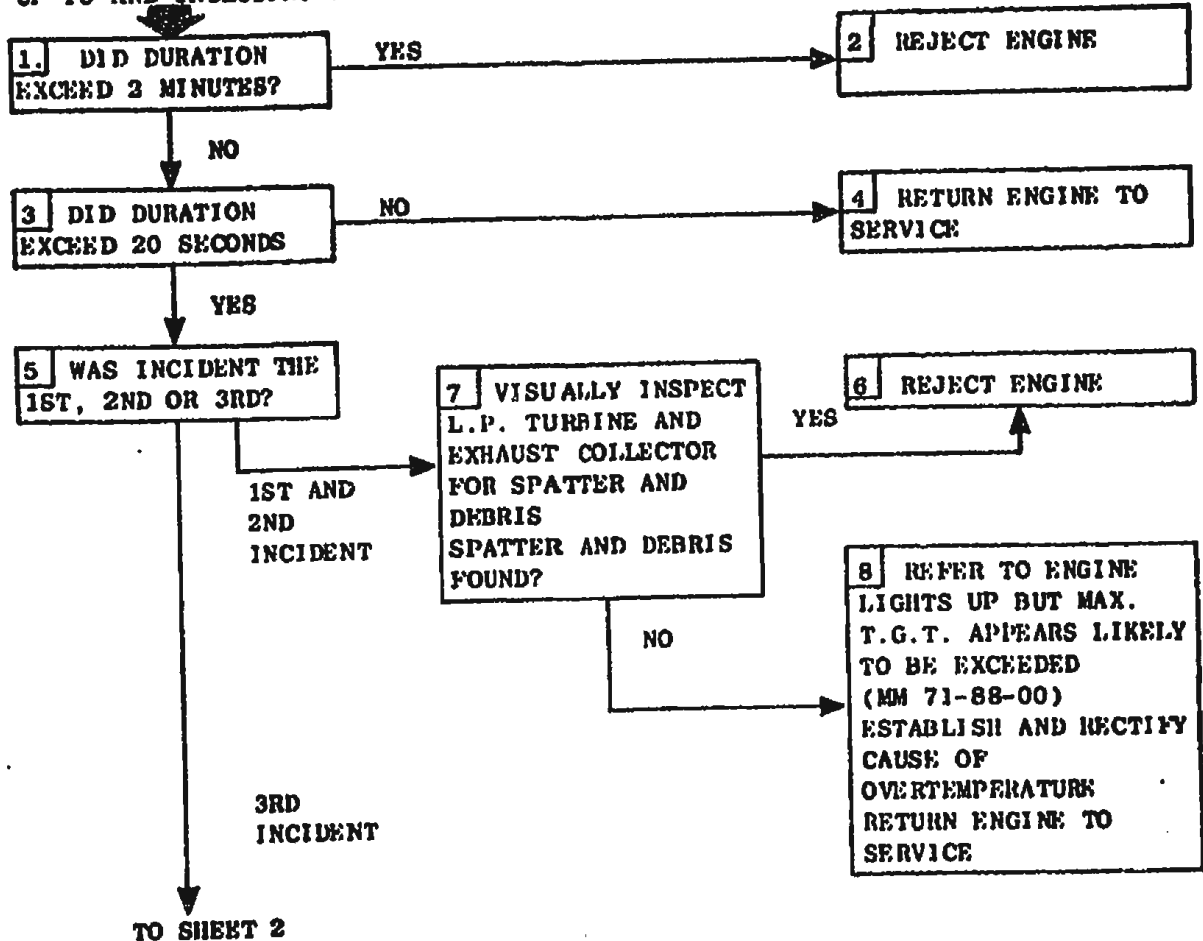
71-89-00

Page 109
Nov 15/89



RB.211 Propulsion System MAINTENANCE

OVERTEMPERATURE ABOVE 743 DEG.C.
UP TO AND INCLUDING 750 DEG.C.



79728A

Engine overtemperature above 743 deg.C.
up to and including 750 deg.C.
Fig.104 (Sheet 3 of 4)

R
R
R

EFFECTIVITY: ALL

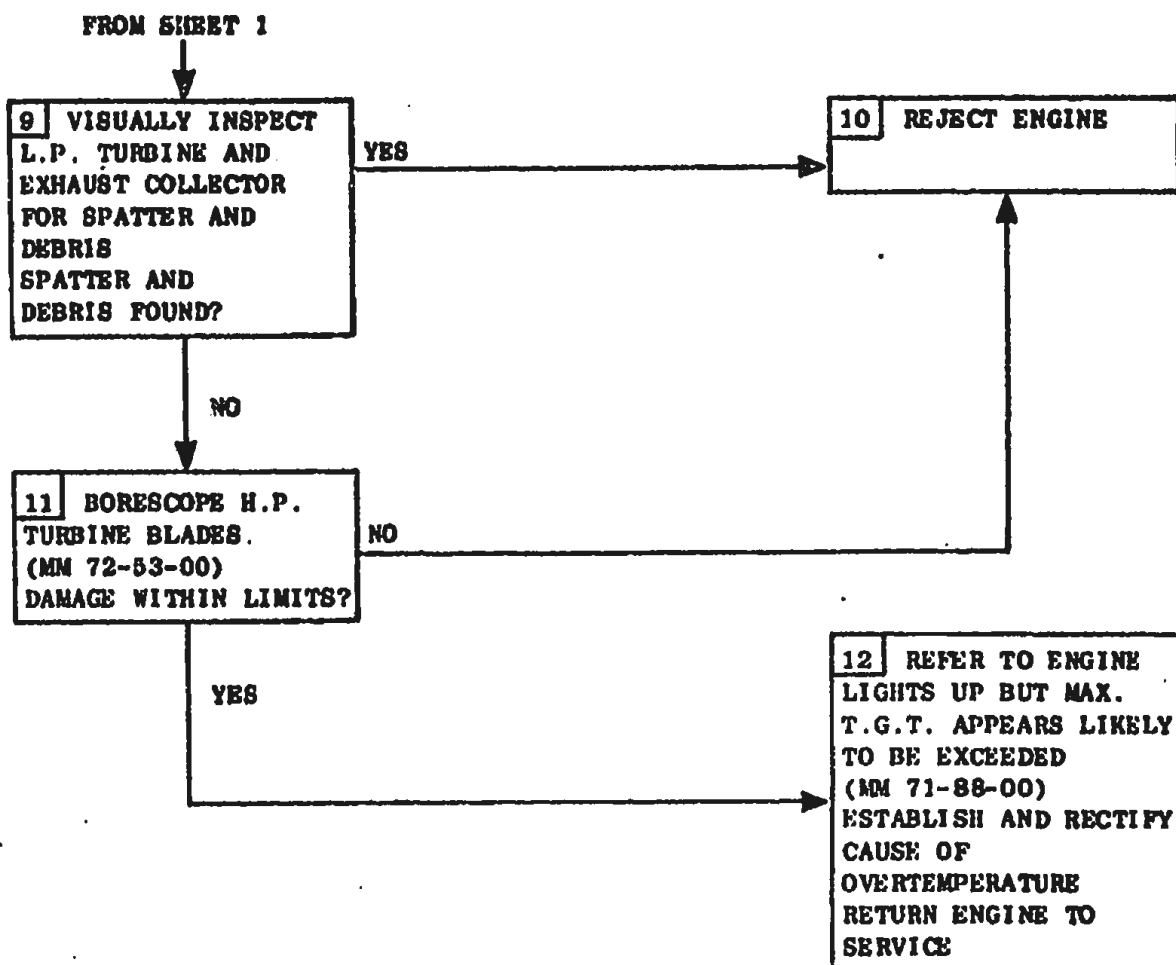
050B

1A

71-89-00
Page 110
Nov 15/89



RB.211 Propulsion System MAINTENANCE



79745

Engine overtemperature above 743 deg.C.
up to and including 750 deg.C.
Fig.104 (Sheet 4 of 4)

R
R
R

EFFECTIVITY: ALL

0508

1A

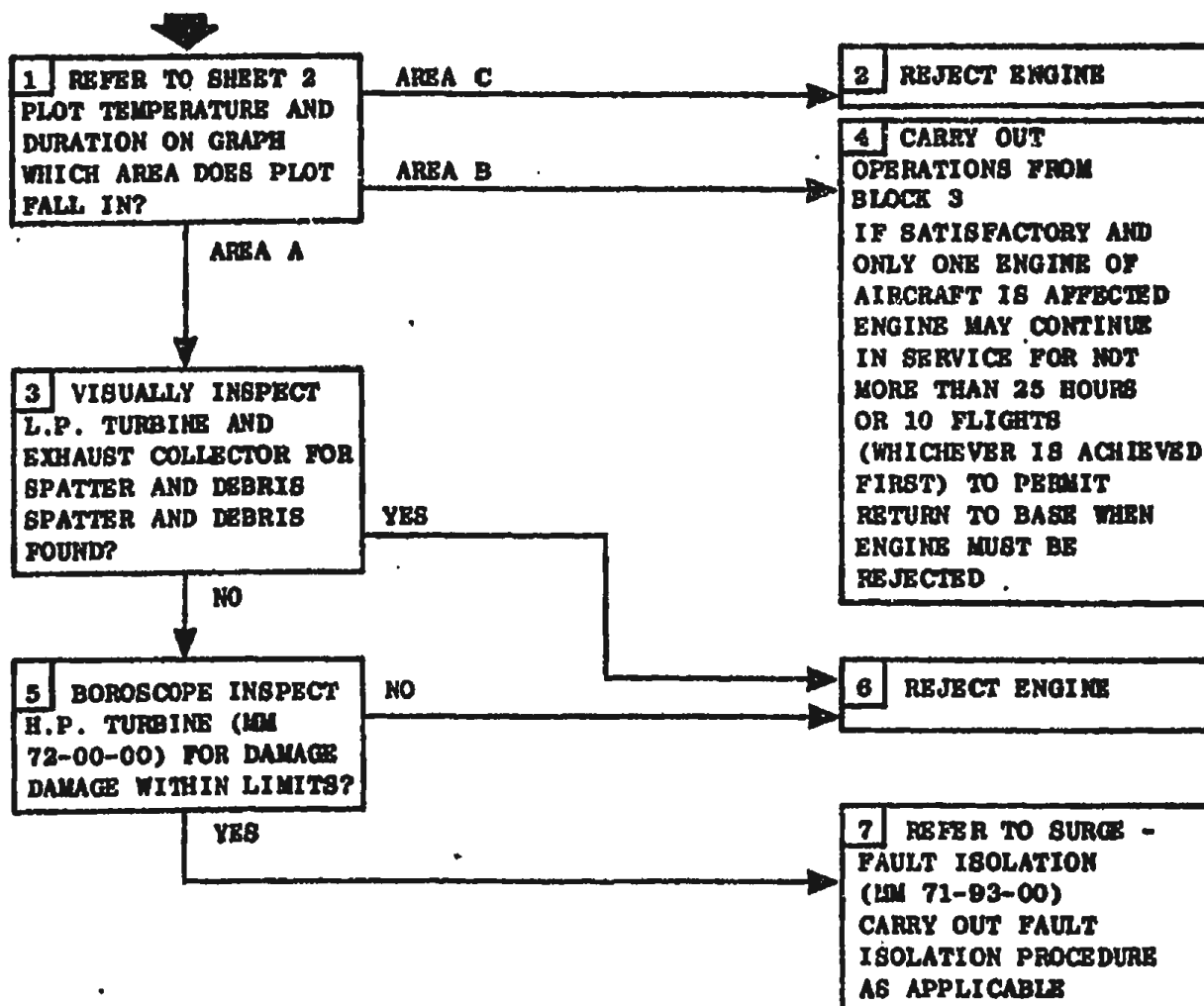
71-89-00
Page 111
Nov 15/89



RB.211 Propulsion System

MAINTENANCE

OVERTEMPORATURE ABOVE 750 DEG.C.
UP TO AND INCLUDING 780 DEG.C.



38635C

R
R
R

Engine overtemperature above 750 deg.C.
up to and including 780 deg.C.
Fig.105 (Sheet 1 of 2)

EFFECTIVITY: ALL

050B

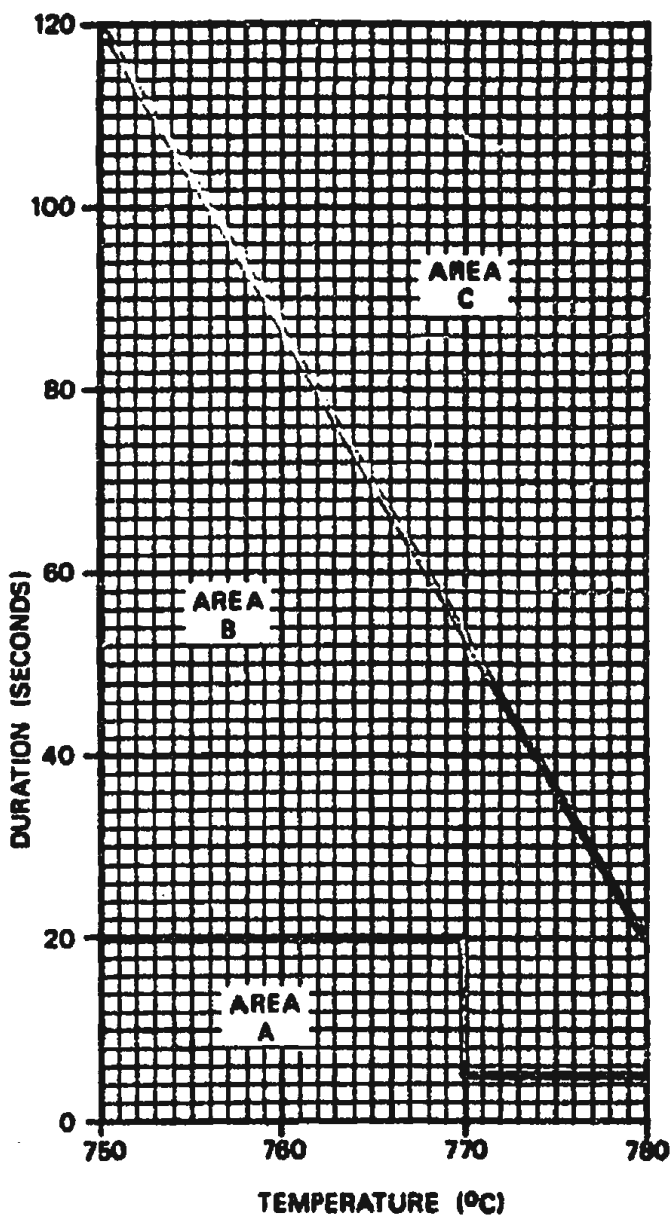
1A

71-89-00
Page 112
Nov 15/89



RB.211 Propulsion System

MAINTENANCE



38420

Engine overtemperature above 750 deg.C.
up to and including 780 deg.C.
Fig.105 (Sheet 2 of 2)

R
R
050B

EFFECTIVITY: ALL

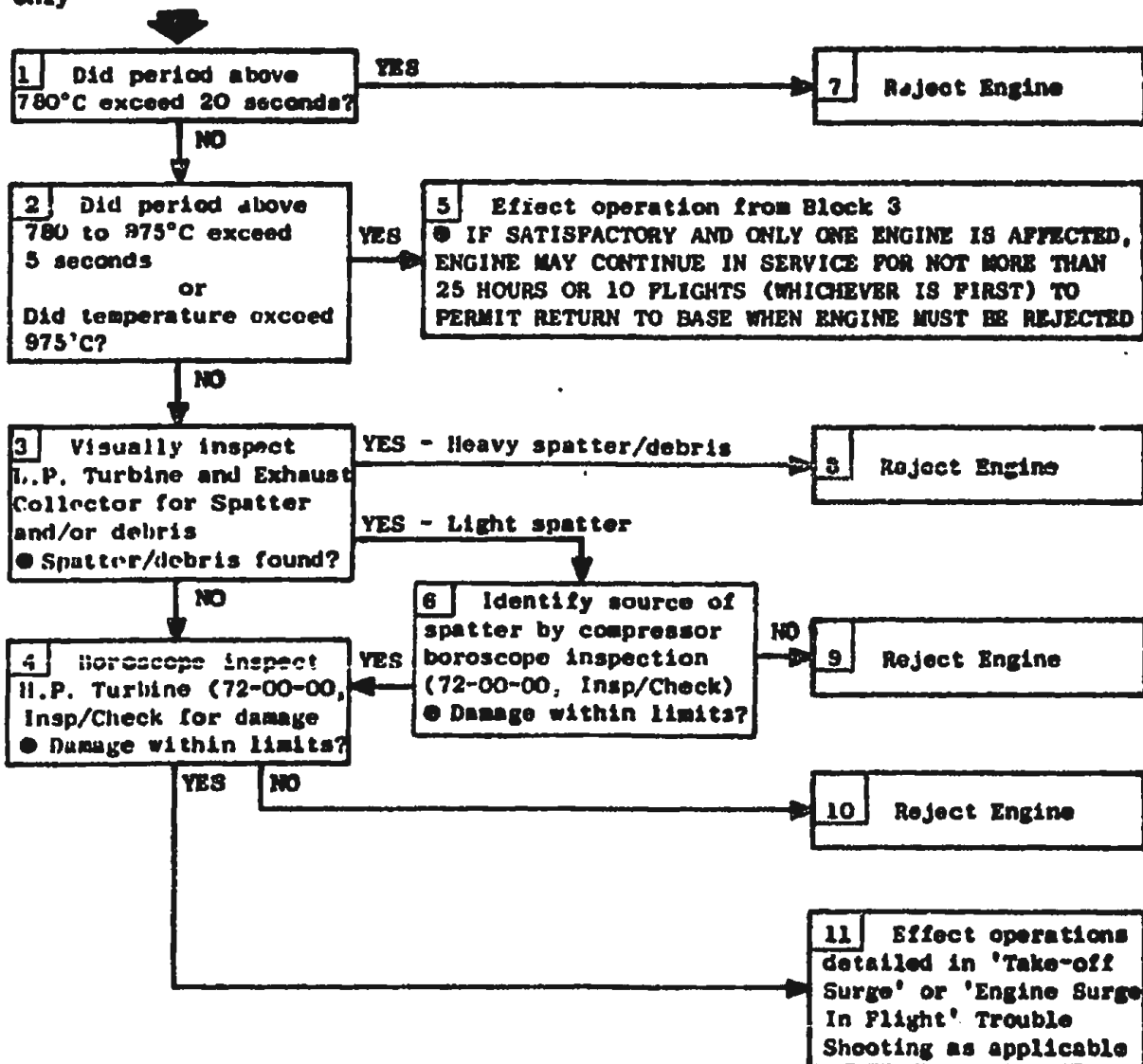
1A

71-89-00
Page 113
Nov 15/89



RB.211 Propulsion System MAINTENANCE

Engine Overtemperature (not starting and
relighting) above 780°C - stall condition
only



36636A

Engine overtemperature above 780 deg.C.
Fig.106

R
R
050B

EFFECTIVITY: ALL

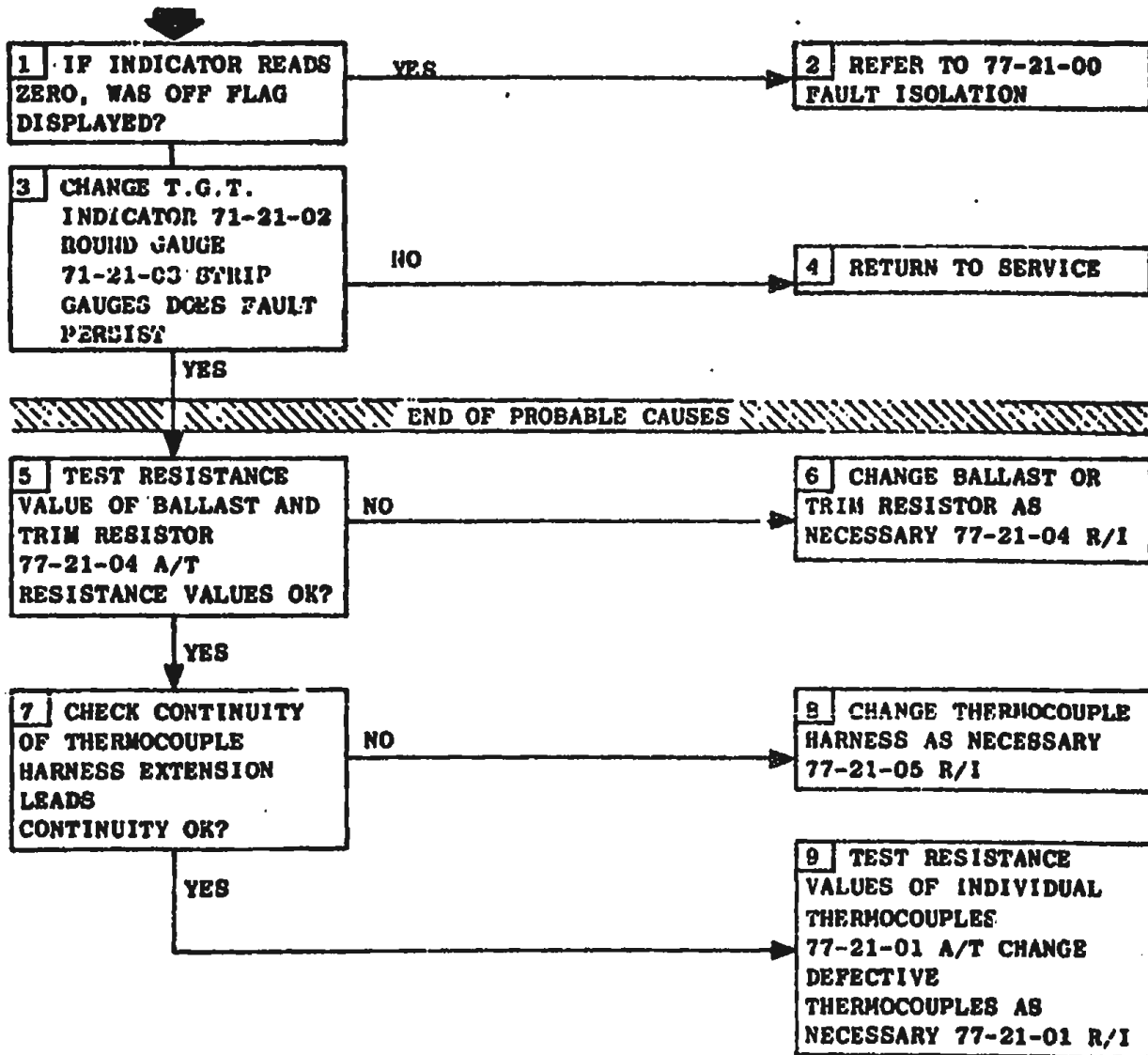
1A

71-89-00
Page 114
Nov 15/89



RB.211 Propulsion System MAINTENANCE

T.G.T. INDICATION
READS LOW/ZERO



50008A

T.G.T. indication reads low/zero
Fig.107

R
R
050B

EFFECTIVITY: ALL

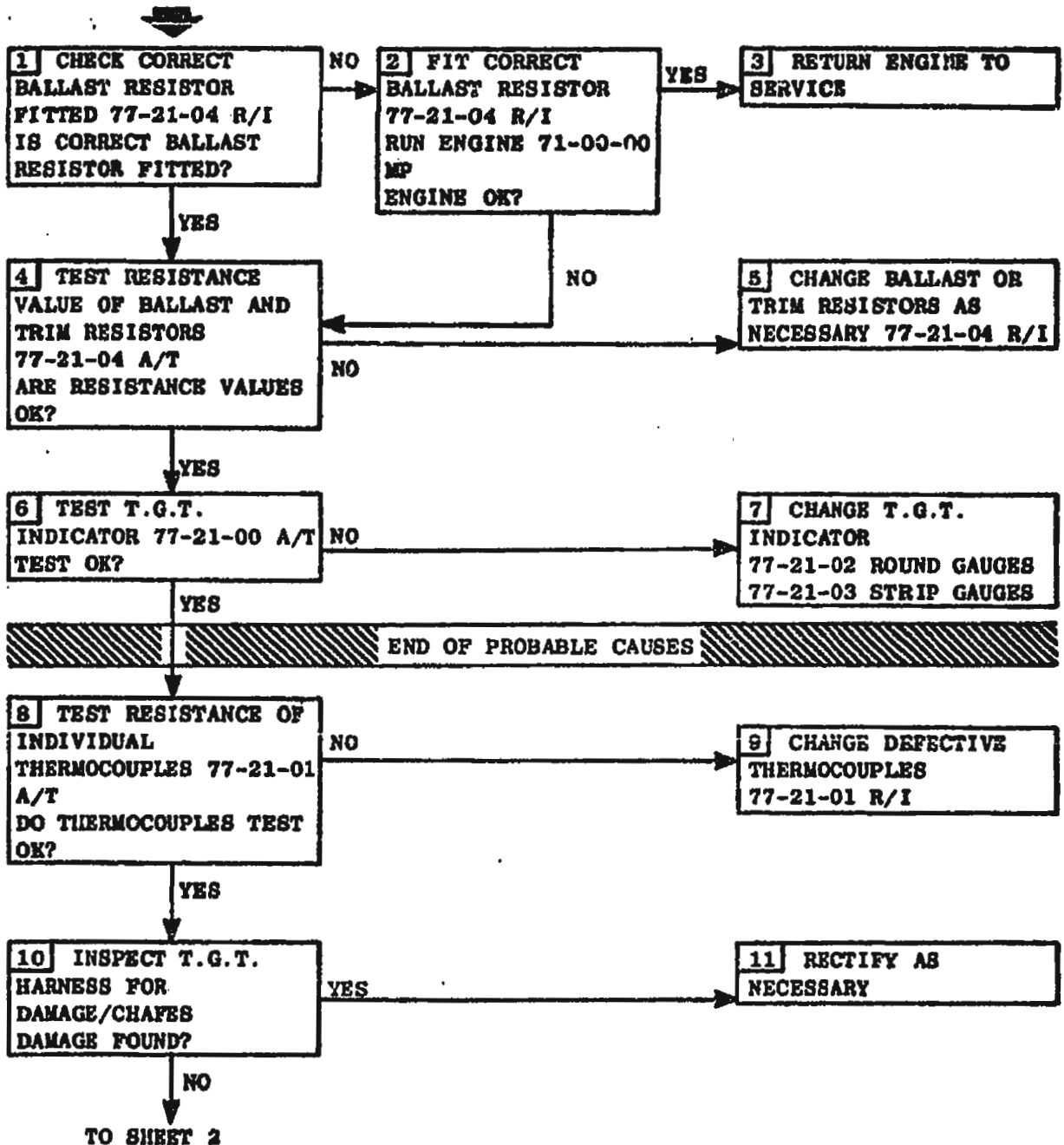
1A

71-89-00
Page 115
Nov 15/89



RB.211 Propulsion System MAINTENANCE

HIGH T.G.T. - ALL OTHER
INDICATIONS NORMAL



50009B

High T.G.T. - all other indications normal
Fig.108 (Sheet 1 of 2)

R
R
050B

EFFECTIVITY: ALL

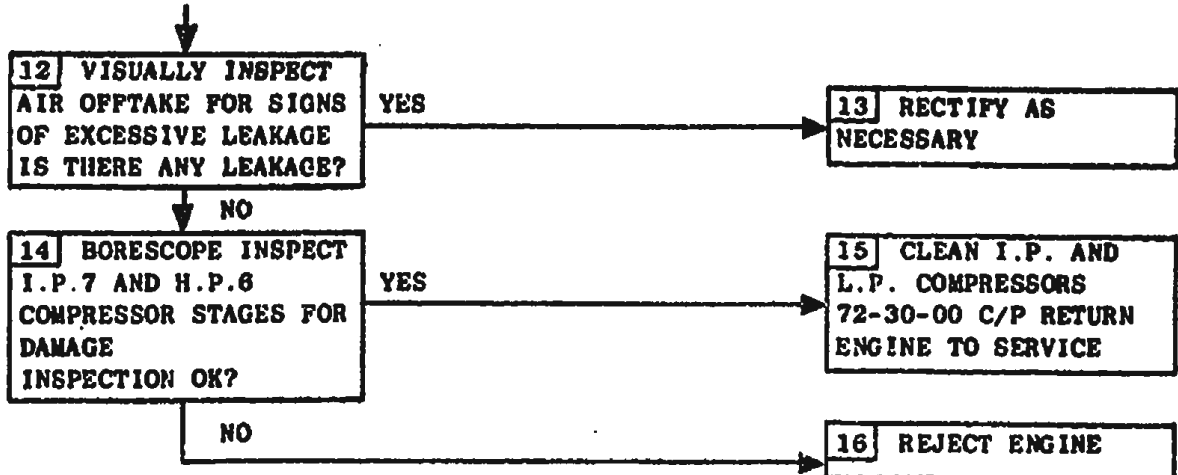
1A

71-89-00
Page 116
Nov 15/89



RB.211 Propulsion System MAINTENANCE

FROM SHEET 1



70731

High T.G.T. - all other indications normal
Fig.108 (Sheet 2 of 2)

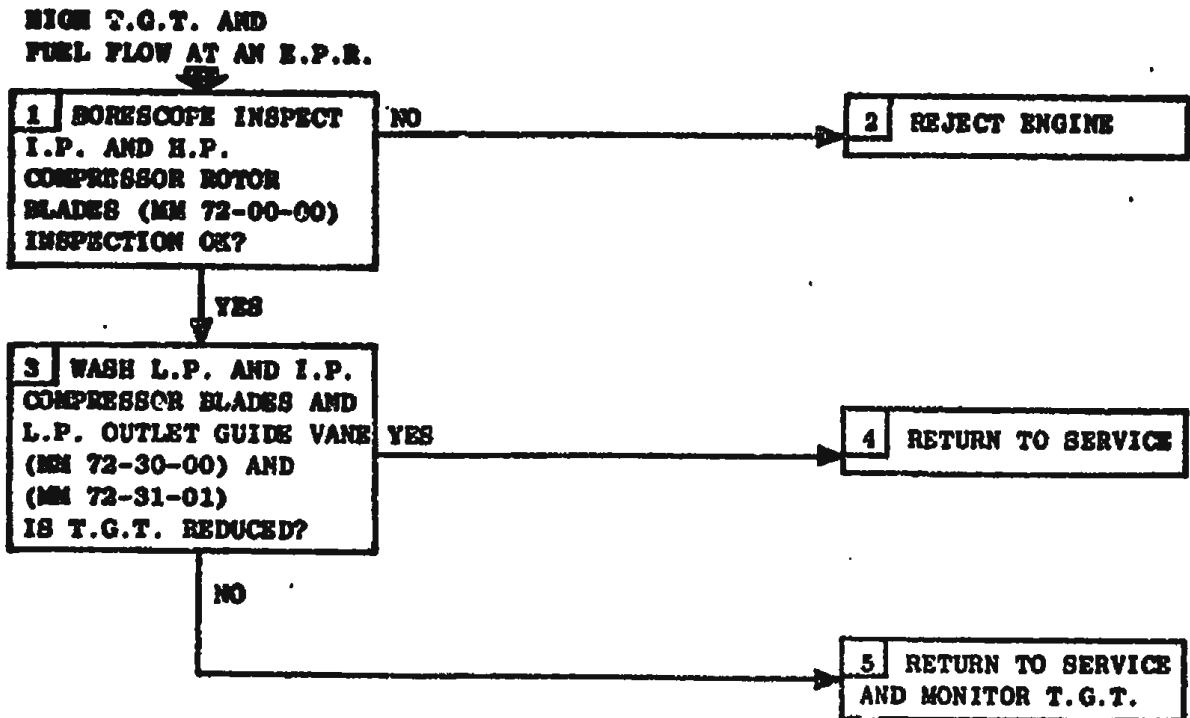
R
R
050B EFFECTIVITY: ALL

1A

71-89-00
Page 117
Mar 15/91



RB.211 Propulsion System MAINTENANCE



57578

R
R

High T.G.T. and fuel flow at an E.P.R.
Fig.109

R
R

EFFECTIVITY: ALL

050B

1A

71-89-00
Page 118
Mar 15/91



RB.211 Propulsion System

MAINTENANCE

VIBRATION - FAULT ISOLATION

1. General

The diagrams and schematics in this section can be used for fault isolation any time a fault is reported or suspected. Uncommon abbreviations are defined on the using fault code diagram or schematic.

If the flight crew reports a fault using a fault code number, the code number can be found in the Fault Isolation Reference Table in the Chapter 71 Fault Code Index. The index specifies the exact maintenance manual section, fault isolation diagram, and block number on the diagram where the fault isolation procedure should start. Where applicable, schematics are included at the end of the section to supplement the fault code diagrams or as an aid in isolating a problem not covered on the diagrams.

Refer to the Maintenance Manual Introduction for a more detailed discussion of the Fault Isolation Reporting Method (FIRM) and use of fault isolation diagrams/schematics.

2. Fault Isolation/Identification

Table 101 lists the fault isolation diagrams and schematics in this section.

TABLE 101

FIGURE	TITLE
103	High indicated vibration
104	Excessive L.P. compressor noise (Excessive aft cabin noise)



RB.211 Propulsion System

MAINTENANCE

<u>COMPONENT</u>	<u>QTY</u>	<u>ACCESS/AREA</u>	<u>REFERENCE</u>
CHIP DETECTOR - MAGNETIC	6	ENGINE: 412, 422, 432	72-01-00
ELEMENT - OIL FINE SCAVENGE FILTER	3	ENGINE: 412, 422, 432	72-01-00
ELEMENT - OIL SCAVENGE STRAINER	3	ENGINE: 412, 422, 432	72-01-00
ELEMENT - OIL PRESSURE FILTER	3	ENGINE: 412, 422, 432	72-01-00
STRAINER - OIL PRESSURE PUMP	3	ENGINE: 412, 422, 432	72-01-00

Component Location Index
Fig.101

R
R
0508

EFFECTIVITY: ALL

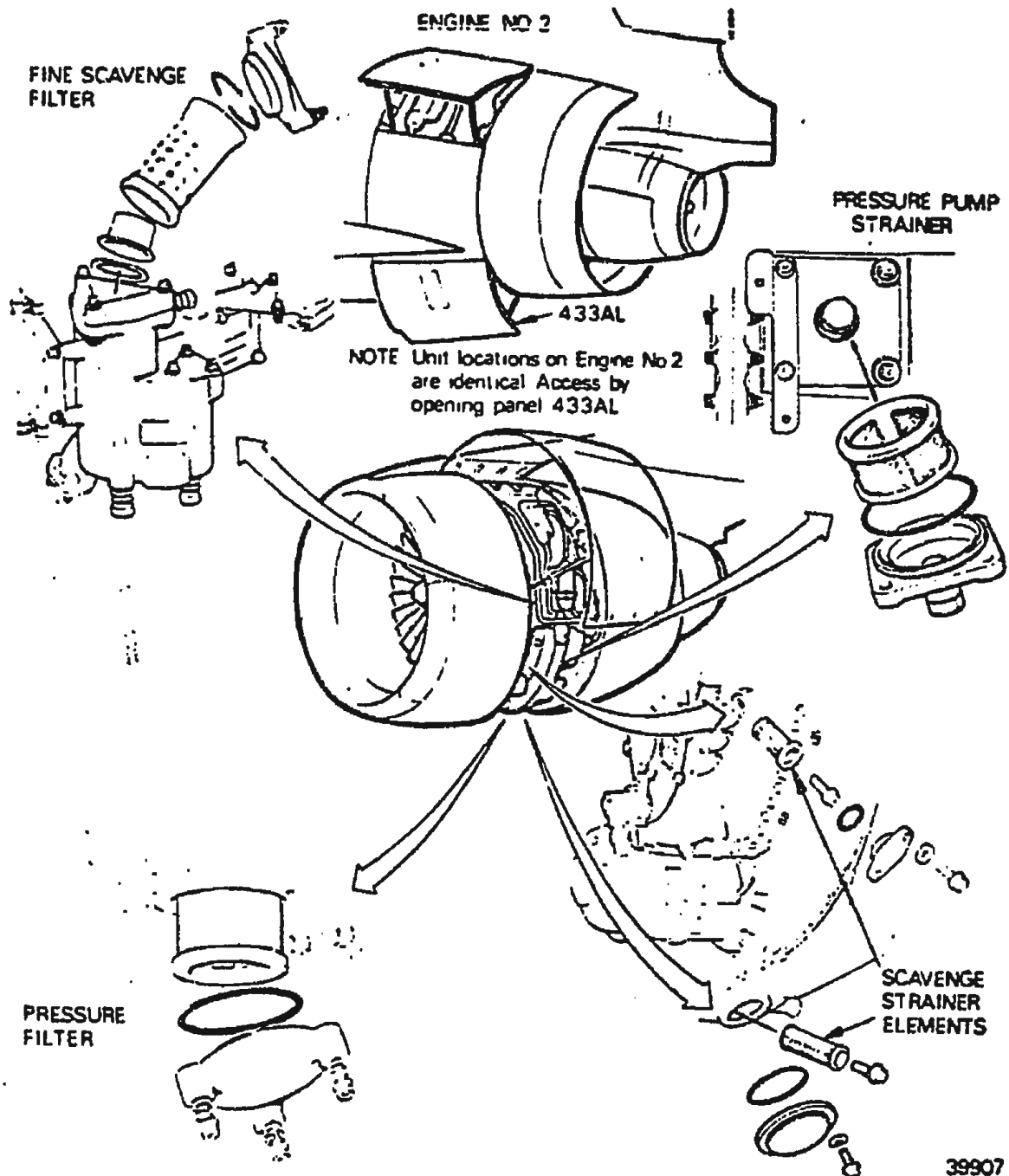
1A

71-91-00
Page 102
May 15/90



RB.211 Propulsion System

MAINTENANCE



Component Locator Diagram
Fig.102 (Sheet 1)

EFFECTIVITY: ALL

71-91-00
Page 103
Mar 15/81

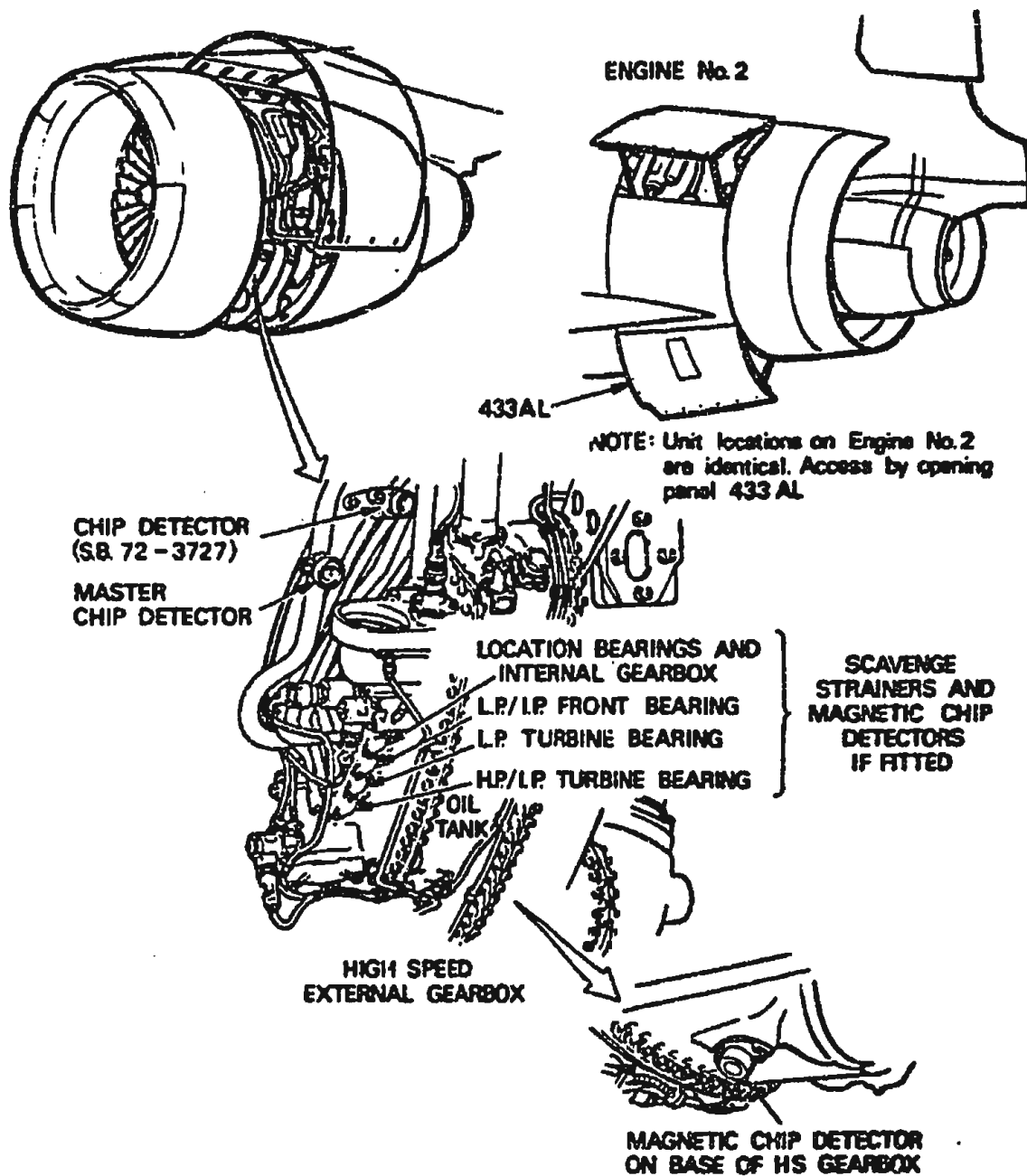
1A

R
R
R
050B



RB.211 Propulsion System

MAINTENANCE



39908

Component Locator Diagram
Fig.102 (Sheet 2)

EFFECTIVITY: ALL

0508

1A

71-91-00

Page 104
Mar 15/81



RB.211 Propulsion System

MAINTENANCE

Notes referred to during fault isolation procedures:

1. If intake and exhaust collector are damage free and during inspection of L.P. Compressor the blades are found to be 'LOCKED UP. Refer to Maintenance Manual (72-31-05 Maintenance Practices) then perform Test 10 and if vibration levels are within acceptable limits return engine to service. If vibration levels are excessive continue with Fault Isolation procedure.
2. If unable to rectify damage - reject engine.
3. If Vibro Meter VM 3X test set is available this may be used.
4. Borescope inspection may be delayed for maximum of 25 hours provided vibration survey Maintenance Manual (71-00-00 Adjustment/Test) Test 10 is performed and vibration levels are within acceptable limits before engine is returned to service.
5. The repeated tightening procedure, of the tubular bolt and retaining nut (MM 72-31-02, Removal/Installation), may be delayed for a maximum of 25 hours, provided vibration survey Maintenance Manual (71-00-00, Adjustment/Test) Test 11 is performed and vibration levels are within acceptable limits before engine is returned to service.

High indicated vibration
Fig.103 (Sheet 1 of 4)

EFFECTIVITY: ALL

050B

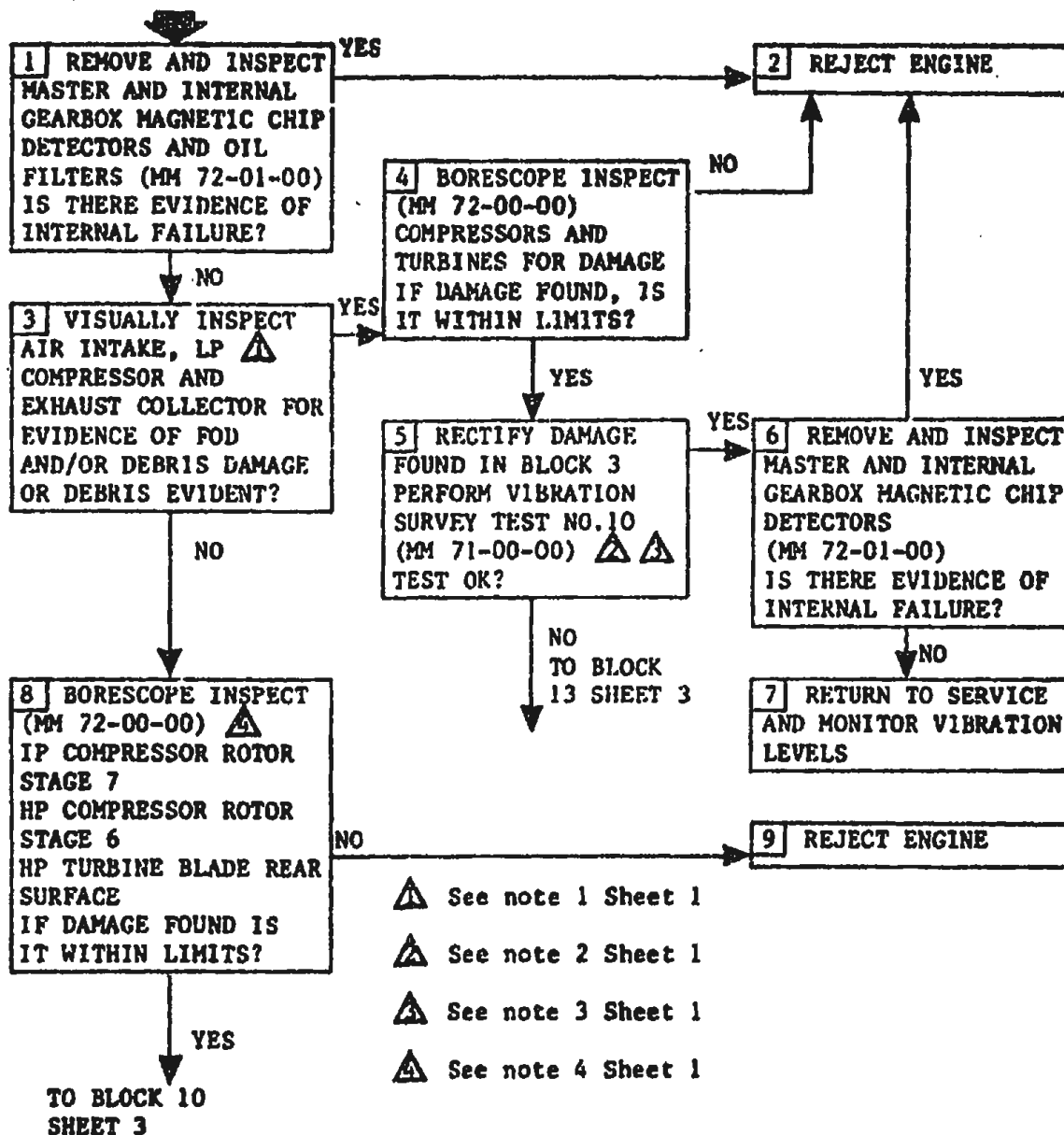
1A

71-91-00
Page 105
Dec 15/91

RB.211 Propulsion System **MAINTENANCE**

HIGH INDICATED VIBRATION

PREREQUISITES: NONE



79778A

CR
CR

High indicated vibration
Fig.103 (Sheet 2 of 4)

EFFECTIVITY: ALL

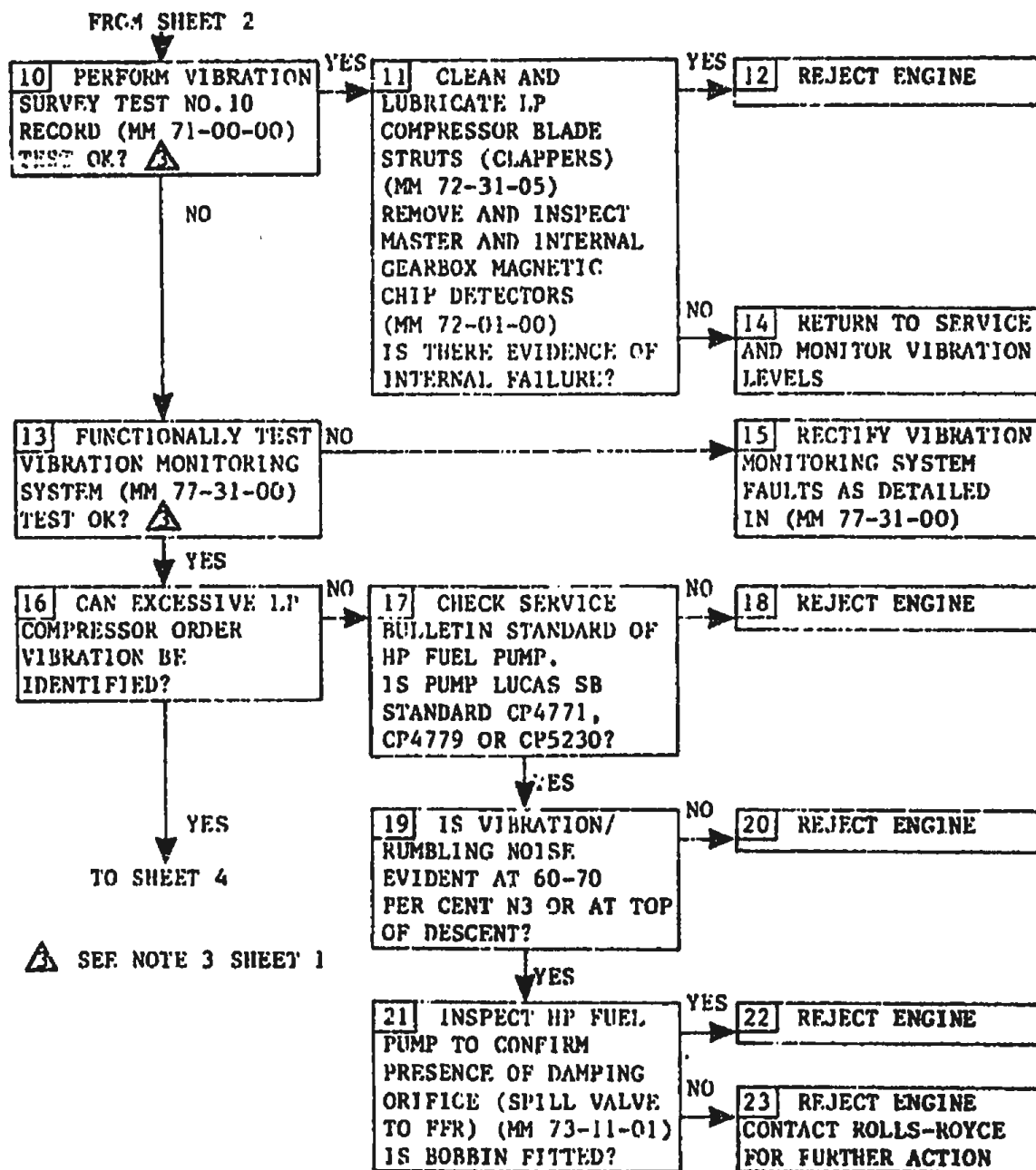
050B

1A

71-91-00
Page 106
Dec 15/91



RB.211 Propulsion System MAINTENANCE



79777A

CR
CR

High indicated vibration
Fig.103 (Sheet 3 of 4)

EFFECTIVITY: ALL

050B

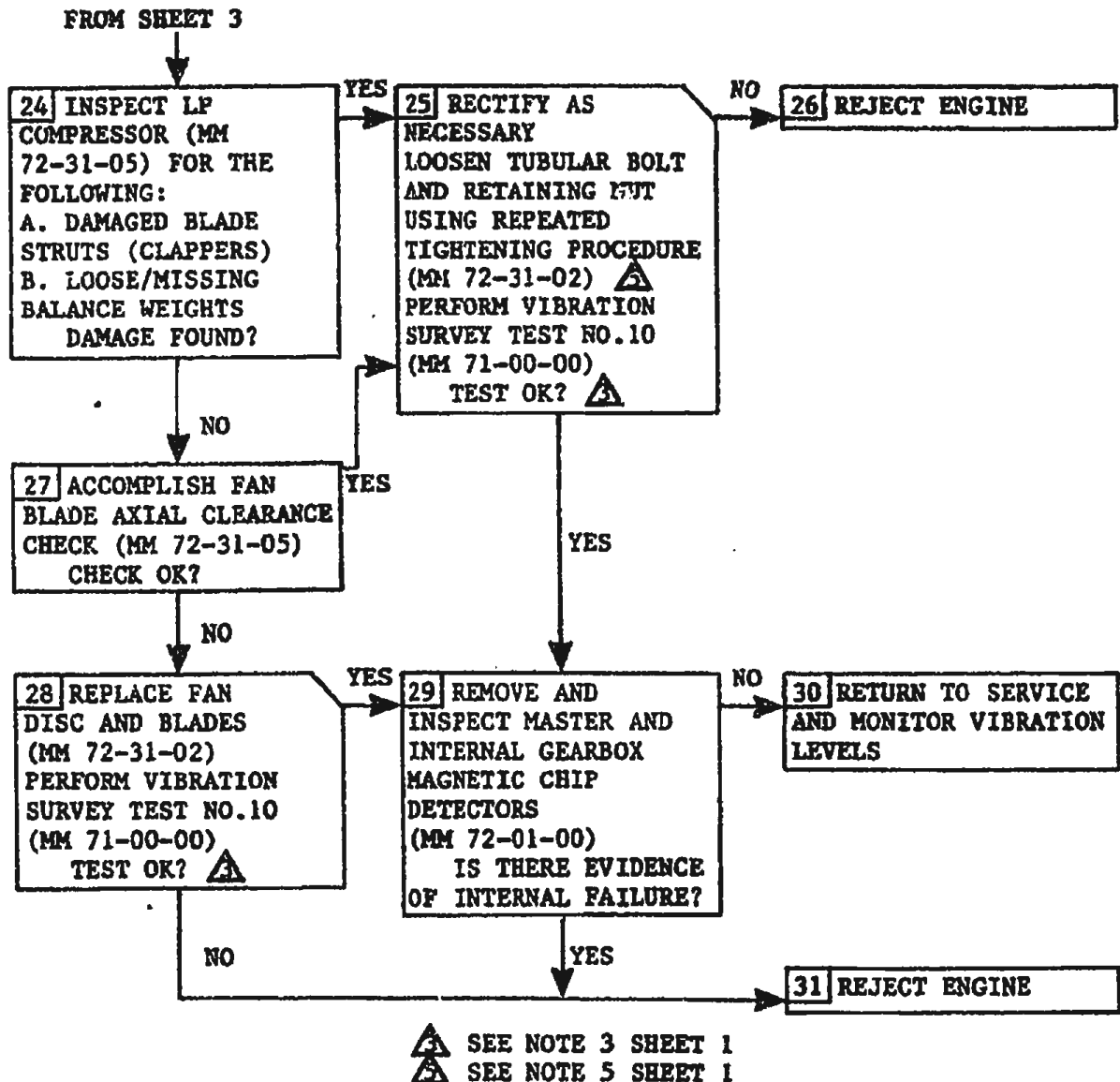
1A

71-91-00

Page 107
Dec 15/91



RB.211 Propulsion System MAINTENANCE



79776B

CR
CR

High indicated vibration
Fig.103 (Sheet 4 of 4)

EFFECTIVITY: ALL

050B

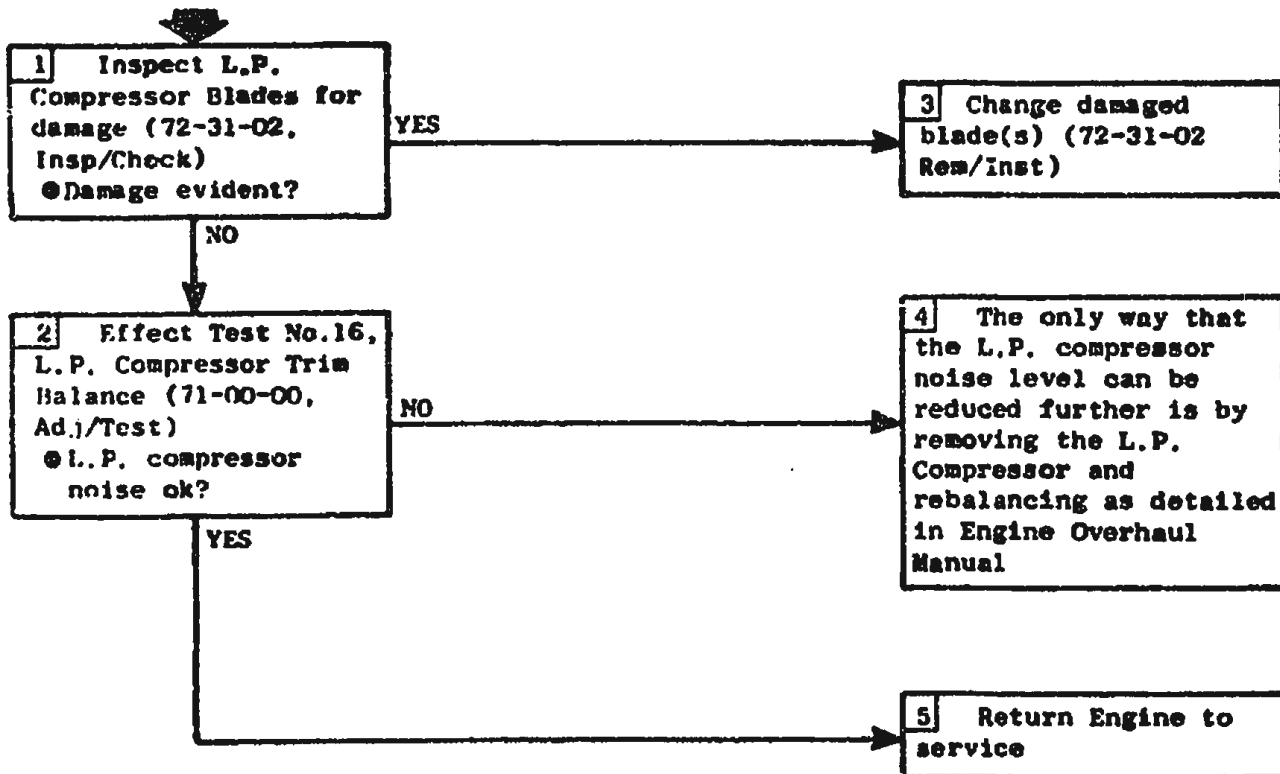
1A

71-91-00
Page 108
Jun 15/93



RB.211 Propulsion System MAINTENANCE

Excessive L.P. Compressor Noise (Excessive Aft Cabin Noise)



34558

Excessive L.P. compressor noise
(Excessive aft cabin noise)
Fig.104

EFFECTIVITY: ALL

0508

1A

71-91-00
Page 109/110
Jun 15/93



BB.211 Propulsion System

MAINTENANCE

SURGE - FAULT ISOLATION

1. General

The diagrams and schematics in this section can be used for fault isolation any time a fault is reported or suspected. Uncommon abbreviations are defined on the using fault code diagram or schematic.

- R If the flight crew reports a fault using a fault code number, the code number can be found in the Fault Isolation Reference Table in the Chapter 71 Fault Code Index. The index specifies the exact maintenance manual section, fault isolation diagram, and block number on the diagram where the fault isolation procedure should start. Where applicable, schematics are included at the end of the section to supplement the fault code diagrams or as an aid in isolating a problem not covered on the diagrams.

Refer to the Maintenance Manual Introduction for a more detailed discussion of the Fault Isolation Reporting Method (FIRM) and use of fault isolation diagrams/schematics.

2. Fault Isolation/Identification

Table 101 lists the fault isolation diagrams and schematics in this section.

TABLE 101

FIGURE	TITLE
101	Take-off surge
102	Engine surge in flight

EFFECTIVITY: ALL

050B

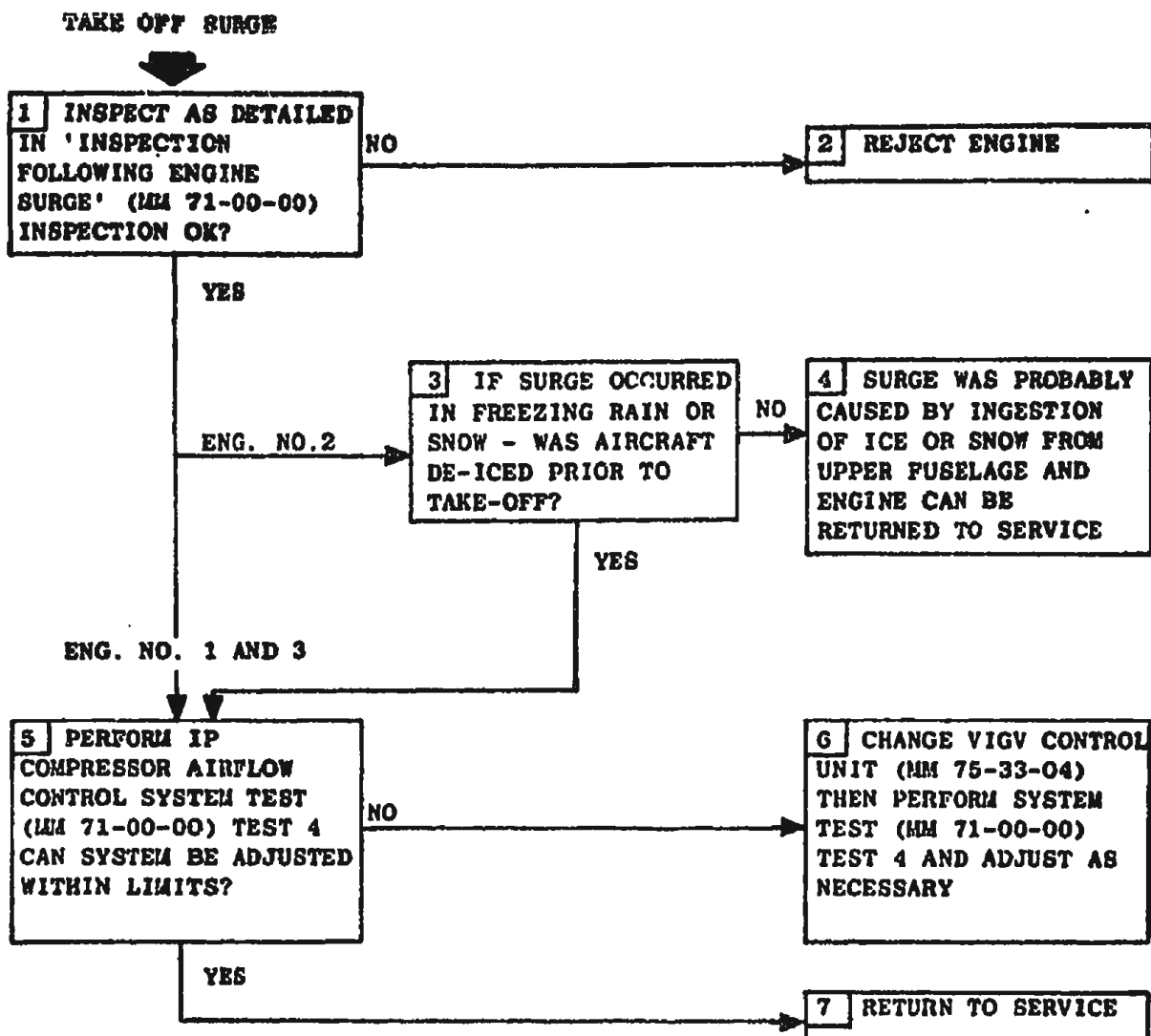
16

71-93-00

Page 101
Nov 15/85



RB.211 Propulsion System MAINTENANCE



50013A

R
R

Take-off surge
Fig.101

EFFECTIVITY: ALL

050B

1G

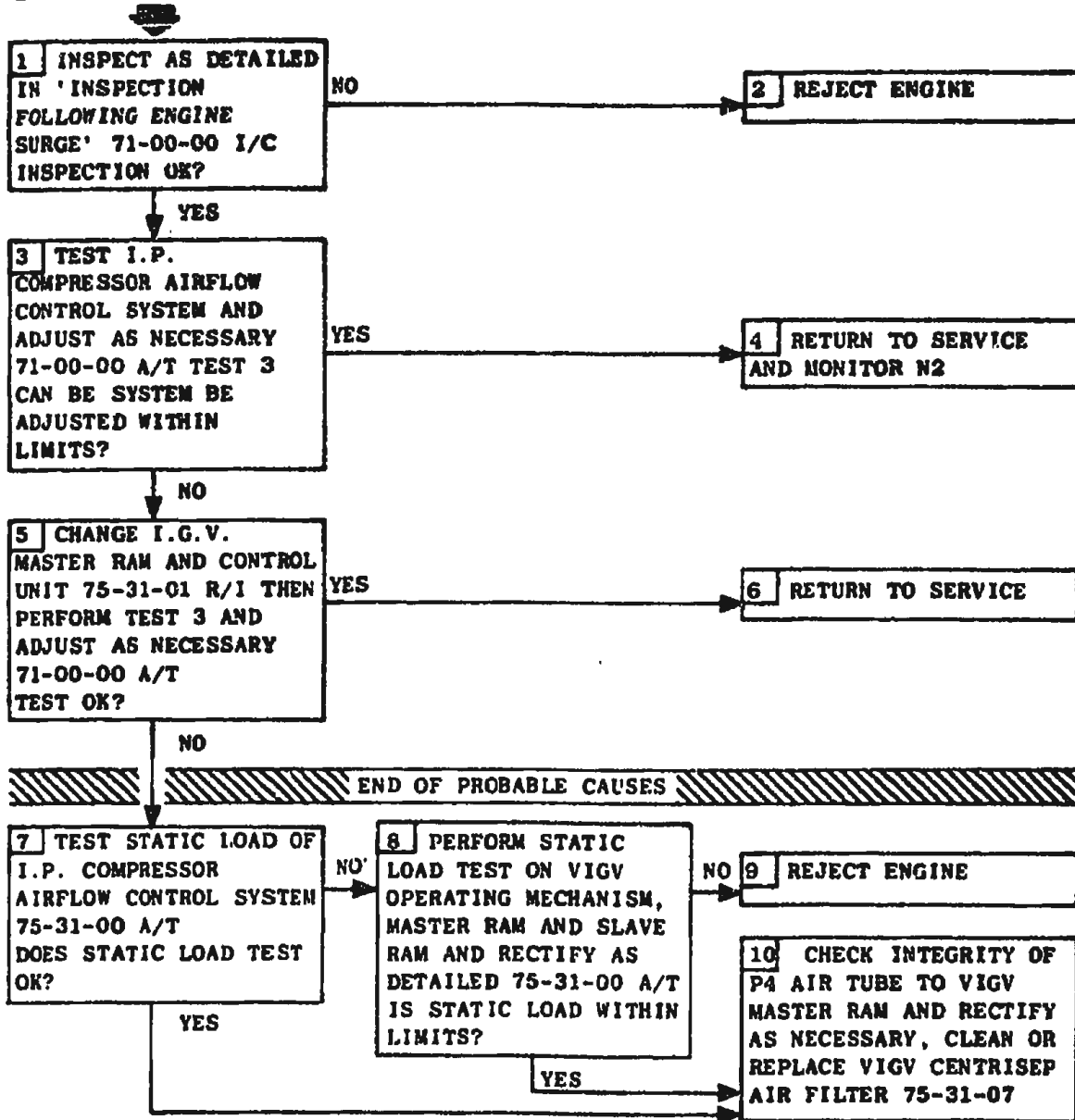
71-93-00
Page 102
Nov 15/85



RB.211 Propulsion System

MAINTENANCE

ENGINE SURGE IN FLIGHT



50061

C
C

Engine surge in flight
Fig.102

EFFECTIVITY: ALL

050B

16

71-93-00
Page 103/104
Nov 15/85



RB.211 Propulsion System MAINTENANCE

ENGINE TURBINE COOLING AIR -- FAULT ISOLATION

1. General

The diagrams and schematics in this section can be used for fault isolation any time a fault is reported or suspected. Uncommon abbreviations are defined on the using fault code diagram or schematic.

- R If the flight crew reports a FAULT using a fault code number, the code number can be found in the Fault Isolation Reference Table in the Chapter 71 Fault Code Index. The index specifies the exact maintenance manual section, fault isolation diagram, and block number on the diagram where the fault isolation procedure should start. Where applicable, schematics are included at the end of the section to supplement the fault code diagrams or as an aid in isolating a problem not covered on the diagrams.

Refer to the Introduction for a more detailed discussion of the Fault Isolation Reporting Method (FIRM) and use of the fault isolation diagrams/schematics.

2. Fault Isolation/Identification

Table 101 lists the fault isolation diagrams and schematics in this section.

TABLE 101

FIGURE	TITLE
101	Engine Turbine Cooling Air Overheat Warning Light On

EFFECTIVITY: ALL

050B

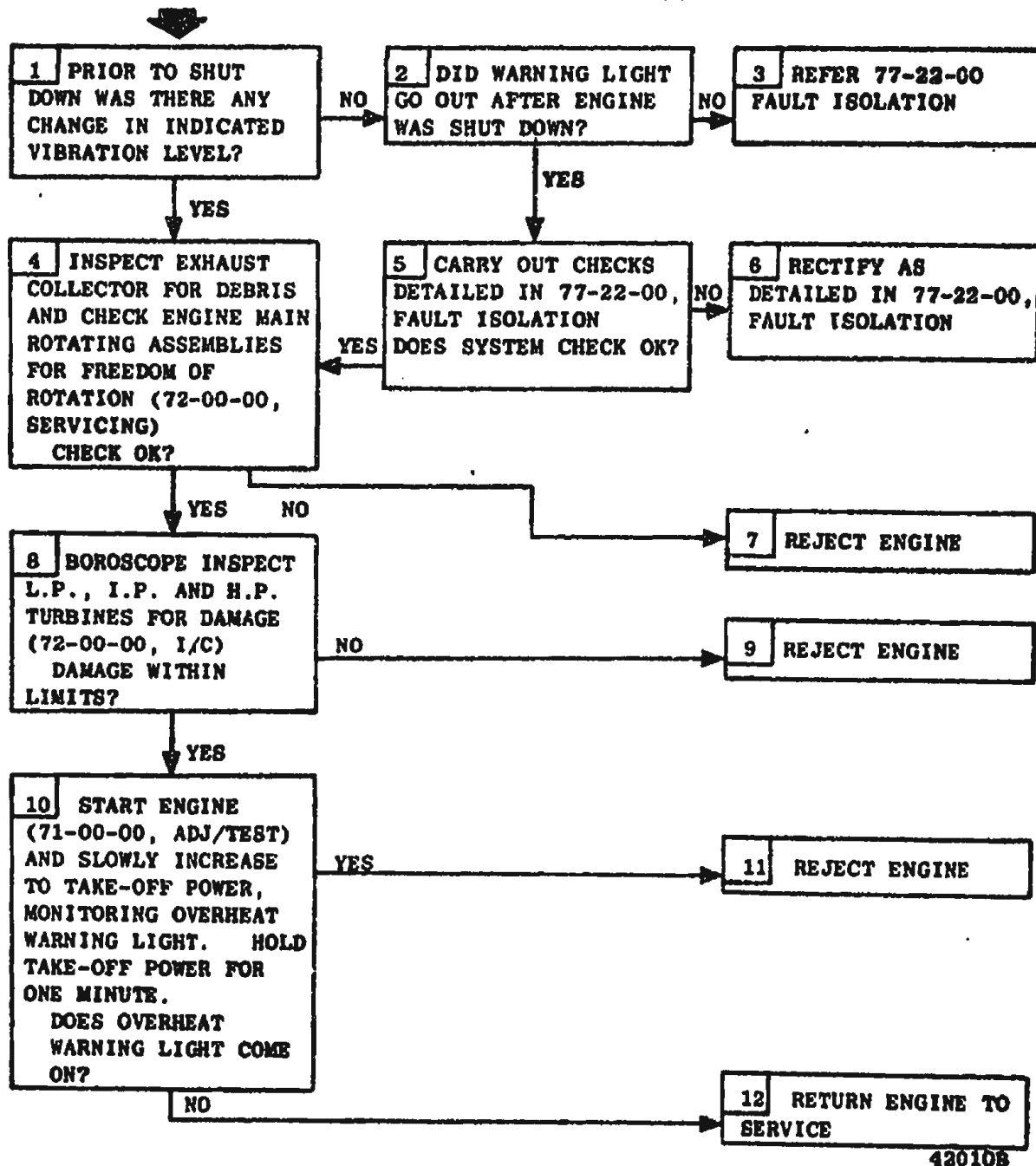
1A

71-95-00
Page 101
Jul 15/84



B.211 Propulsion System MAINTENANCE

ENGINE TURBINE COOLING AIR OVERHEAT WARNING LIGHT ON



R
R

Engine turbine cooling air overheat warning light ON
Fig.101

EFFECTIVITY: ALL

050B

1A

71-95-00
Page 102
Jul 15/84



RB.211 Propulsion System

MAINTENANCE

MISCELLANEOUS FAULTS - FAULT ISOLATION

1. General

The diagrams and schematics in this section can be used for fault isolation any time a fault is reported or suspected. Uncommon abbreviations are defined on the using fault code diagram or schematic.

If the flight crew reports a fault using a fault code number, the code number can be found in the Fault Isolation Reference Table in the Chapter 71 Fault Code Index. The index specifies the exact maintenance manual section, fault isolation diagram, and block number on the diagram where the fault isolation procedure should start. Where applicable, schematics are included at the end of the section to supplement the fault code diagrams or as an aid in isolating a problem not covered on the diagrams.

Refer to the Maintenance Manual Introduction for a more detailed discussion of the Fault Isolation Reporting Method (FIRM) and use of fault isolation diagrams/schematics.

2. Fault Isolation/Identification

C NOTE: Also refer to Chapters 5-50-08/601 and 71-00-00/601.

Table 101 lists the fault isolation diagrams and schematics in this section.

TABLE 101

FIGURE	TITLE
101	Bird strike/suspected bird strike, no other indications of engine malfunction - engine did not surge
102	Bird strike/suspected bird strike with other indications of engine malfunction - engine did not surge.
103	Bird strike/suspected bird strike, accompanied by engine surge. No other indications of engine malfunction.
104	Bird strike/suspected bird strike, accompanied by engine surge and with other indications of engine malfunction.
R 105	Nose cowl Thermal Anti-icing Blow-out door found open after flight or following engine ground running.
R	

EFFECTIVITY: ALL

050B

1T

71-99-00

Page 101
Jun 15/92



RB.211 Propulsion System

MAINTENANCE

Notes referred to during Fault Isolation procedures:

1. If after a Bird strike an unusual odour was noted in the cabin, or it is considered that the bird was large (exceeding 4 lbs.), borescope inspect as follows:
 - A. H.P. Compressor Stage 1 Rotor Blades (MM 72-00-00).

Damage does not exceed acceptance standards - inspect as in para.B.

No damage - inspect as in para.C.
 - B. Remaining stages of H.P. and I.P. Compressor Rotor Blades (MM 72-00-00).

Damage does not exceed acceptance standards - inspect as in para.C.

No damage - inspect as in para.C.
 - C. Inspect combustion liner metering panel for distortion and/or bowing (Ref.72-00-00 I/C) 'Inspect combustion liner following bird Strike'.
- R 2. If during inspection of I.P. Compressor Fixed Inlet Guide Vanes there are signs or it is suspected that debris has entered the gas generator, borescope inspect H.P. and I.P. Compressor Stage 1 Rotor Blades (72-00-00 I/C). If no damage found, or damage is within limits, borescope inspect Combustion chamber metering panel for bowing/distortion as detailed in (72-00-00 I/C) under 'Inspect combustion liners following bird strike'.
3. Running engine with bent L.P. Compressor Blades is permissible provided ground idle is not exceeded.

'Hot Start' following bird strike is indicative of H.P.1 Compressor damage.

Bird strike/suspected bird strike, no other indications
of engine malfunction - engine did not surge
Fig.101 (Sheet 1)

EFFECTIVITY: ALL

050B

1T

71-99-00

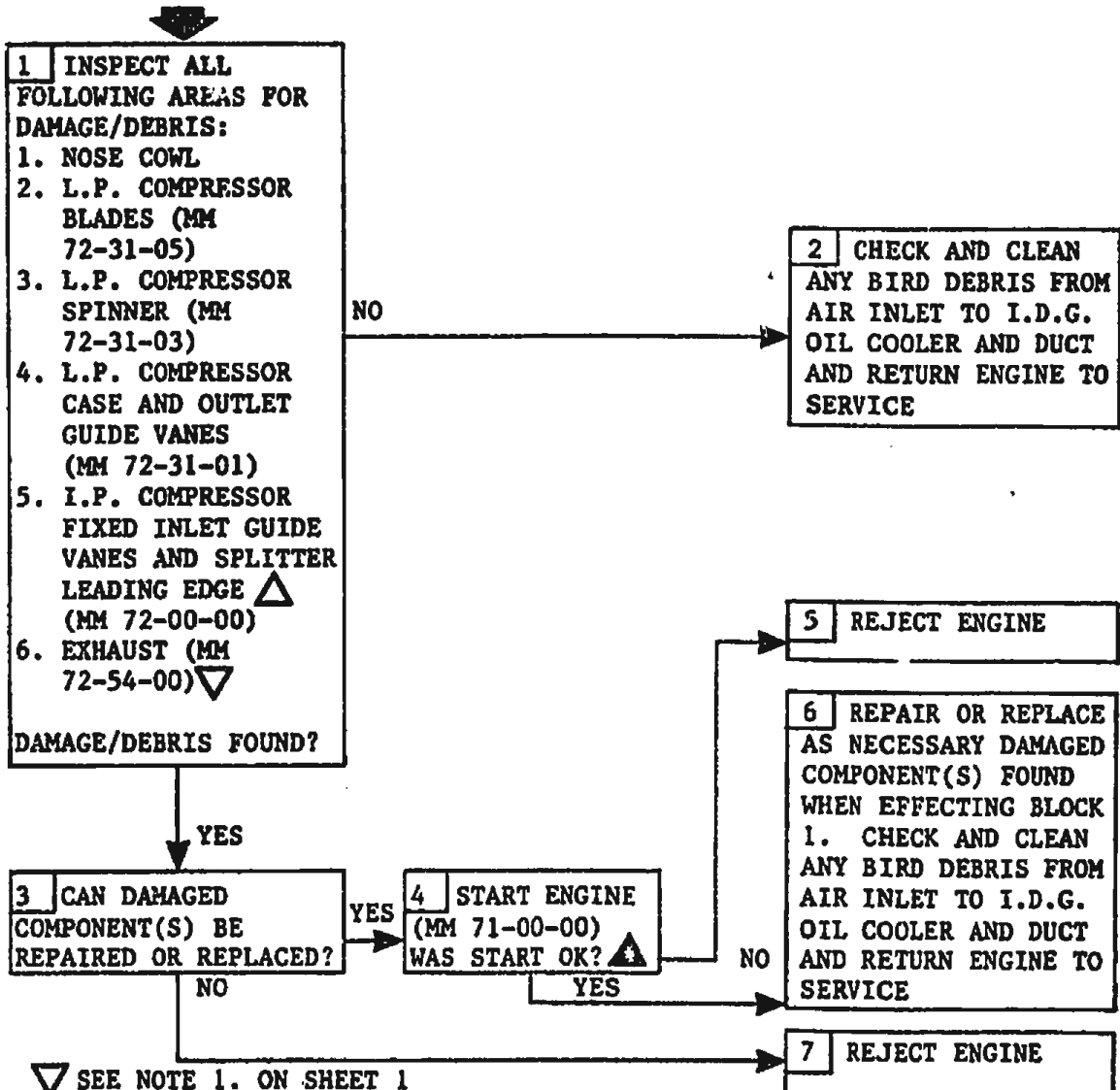
Page 102
Jun 15/92



RB.211 Propulsion System

MAINTENANCE

BIRD STRIKE/SUSPECTED BIRD STRIKE, NO OTHER INDICATIONS OF ENGINE MALFUNCTION - ENGINE DID NOT SURGE



39497D

R
R
R

Bird strike/suspected bird strike, no other indication of engine malfunction - engine did not surge
Fig.101 (Sheet 2)

EFFECTIVITY: ALL

050B

1T

71-99-00
Page 103
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

Notes referred to during Fault Isolation procedures:

1. If after a Bird strike an unusual odour was noted in the cabin, or it is considered that the bird was large (exceeding 4 lbs.), borescope inspect as follows:
 - A. H.P. Compressor Stage 1 Rotor Blades (MM 72-00-00).
Damage does not exceed acceptance standards - inspect as in para.B.
No damage - inspect as in para.C.
 - B. Remaining stages of H.P. and I.P. Compressor Rotor Blades (MM 72-00-00).
Damage does not exceed acceptance standards - inspect as in para.C.
No damage - inspect as in para.C.
 - C. Inspect combustion liner metering panel for distortion and/or bowing (Ref.72-00-00 I/C) 'Inspect combustion liner following bird-strike'.
 - R 2. If during inspection of I.P. Compressor Fixed Inlet Guide Vanes there are signs or it is suspected that debris has entered the gas generator, borescope inspect H.P. and I.P. Compressor Stage 1 Rotor Blades (72-00-00 I/C). If no damage found, or damage is within limits borescope inspect Combustion chamber metering panel for bowing/distortion as detailed in (72-00-00 I/C) under 'Inspect combustion liners following bird-strike'.
 3. Running engine with bent L.P. Compressor Blades is permissible provided ground idle is not exceeded.
'Hot Start' following bird strike is indicative of H.P.1 Compressor damage.
 4. If other indications of malfunction recorded at time of bird strike were limited to momentary fluctuations of engine parameters, these may be ignored, provided indications returned to normal immediately.
- Bird strike/suspected bird strike, with other indications of engine malfunction - engine did not surge
Fig.102 (Sheet 1)

EFFECTIVITY: ALL

0508

1T

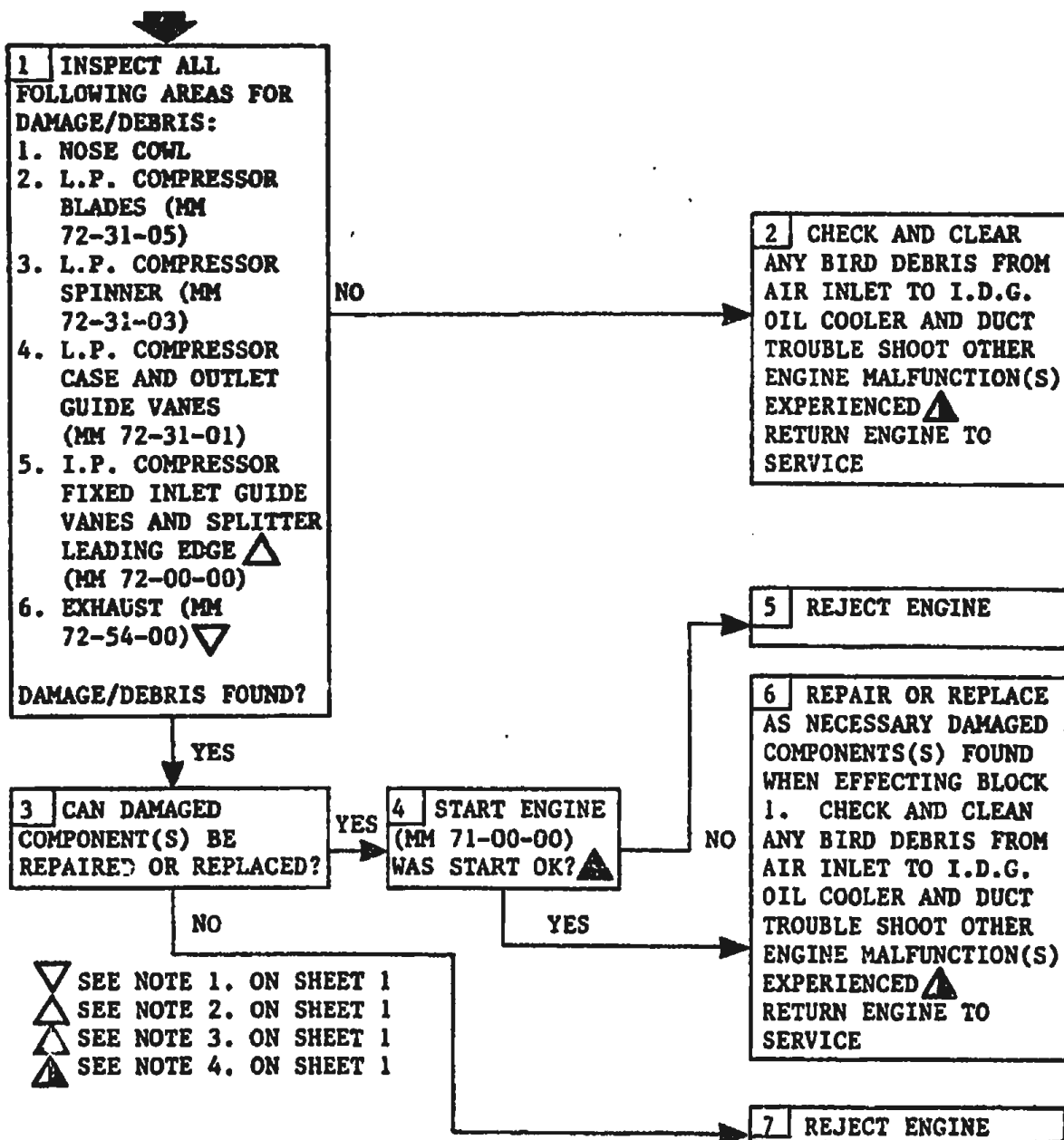
71-99-00
Page 104
Jun 15/92



RB.211 Propulsion System

MAINTENANCE

BIRD STRIKE/SUSPECTED BIRD STRIKE, WITH OTHER INDICATIONS OF ENGINE MALFUNCTION - ENGINE DID NOT SURGE



39897F

R
R
R

Bird strike/suspected bird strike, with other indications of engine malfunction - engine did not surge
Fig.102 (Sheet 2)

EFFECTIVITY: ALL

050B

1T

71-99-00

Page 105
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

Notes referred to during trouble shooting procedure:

- R 1. If during inspection of I.P. Compressor Fixed Inlet Guide Vanes there are signs or it is suspected that debris has entered the gas generator, borescope inspect H.P. Compressor Stage 1 Rotor Blades (72-00-00 I/C). If damage is within limits borescope inspect Combustion Liner (72-00-00 I/C).**
- 2. Running engine with bent L.P. Compressor Blades is permissible provided ground idle is not exceeded.
'Hot Start' following bird strike is indicative of H.P.1 Compressor damage.**

**Bird strike/suspected bird strike, accompanied by engine surge. No other indications of engine malfunction
Fig.103 (Sheet 1)**

EFFECTIVITY: ALL

050B

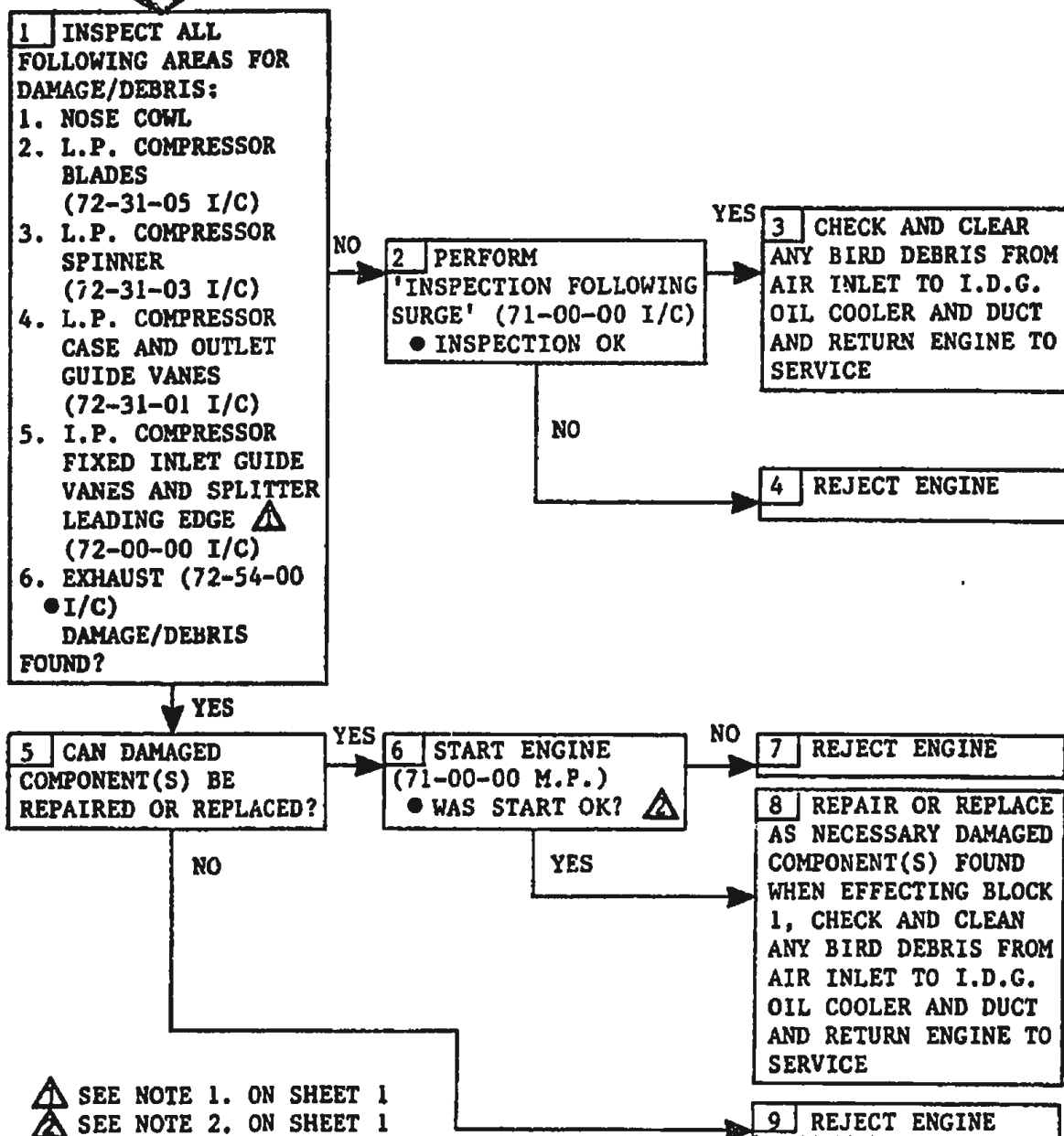
1T

71-99-00
Page 106
Jun 15/92



RB.211 Propulsion System MAINTENANCE

BIRD STRIKE/SUSPECTED BIRD STRIKE ACCOMPANIED BY ENGINE SURGE.
NO OTHER INDICATIONS OF ENGINE MALFUNCTION.



39502C

R
R
R

Bird strike/suspected bird strike, accompanied by engine surge. No other indications of engine malfunction
Fig.103 (Sheet 2)

EFFECTIVITY: ALL

050B

17

71-99-00

Page 107
Jun 15/94



RB.211 Propulsion System

MAINTENANCE

Notes referred to during trouble shooting procedure:

1. If during inspection of I.P. Compressor Fixed Inlet Guide Vanes there are signs or it is suspected that debris has entered the gas generator, borescope inspect H.P. Compressor Stage 1 Rotor Blades (72-00-00 I/C). If damage is within limits borescope inspect Combustion Liner (72-00-00 I/C).
2. Running engine with bent L.P. Compressor Blades is permissible provided ground idle is not exceeded.
'Hot Start' following bird strike is indicative of H.P.1 Compressor damage.
3. If other indications of malfunction recorded at time of bird strike were limited to momentary fluctuations of engine parameters, these may be ignored, provided indications returned to normal immediately.

Bird strike/suspected bird strike, accompanied by engine surge and with other indications of engine malfunction
Fig.104 (Sheet 1)

R
R
0508

EFFECTIVITY: ALL

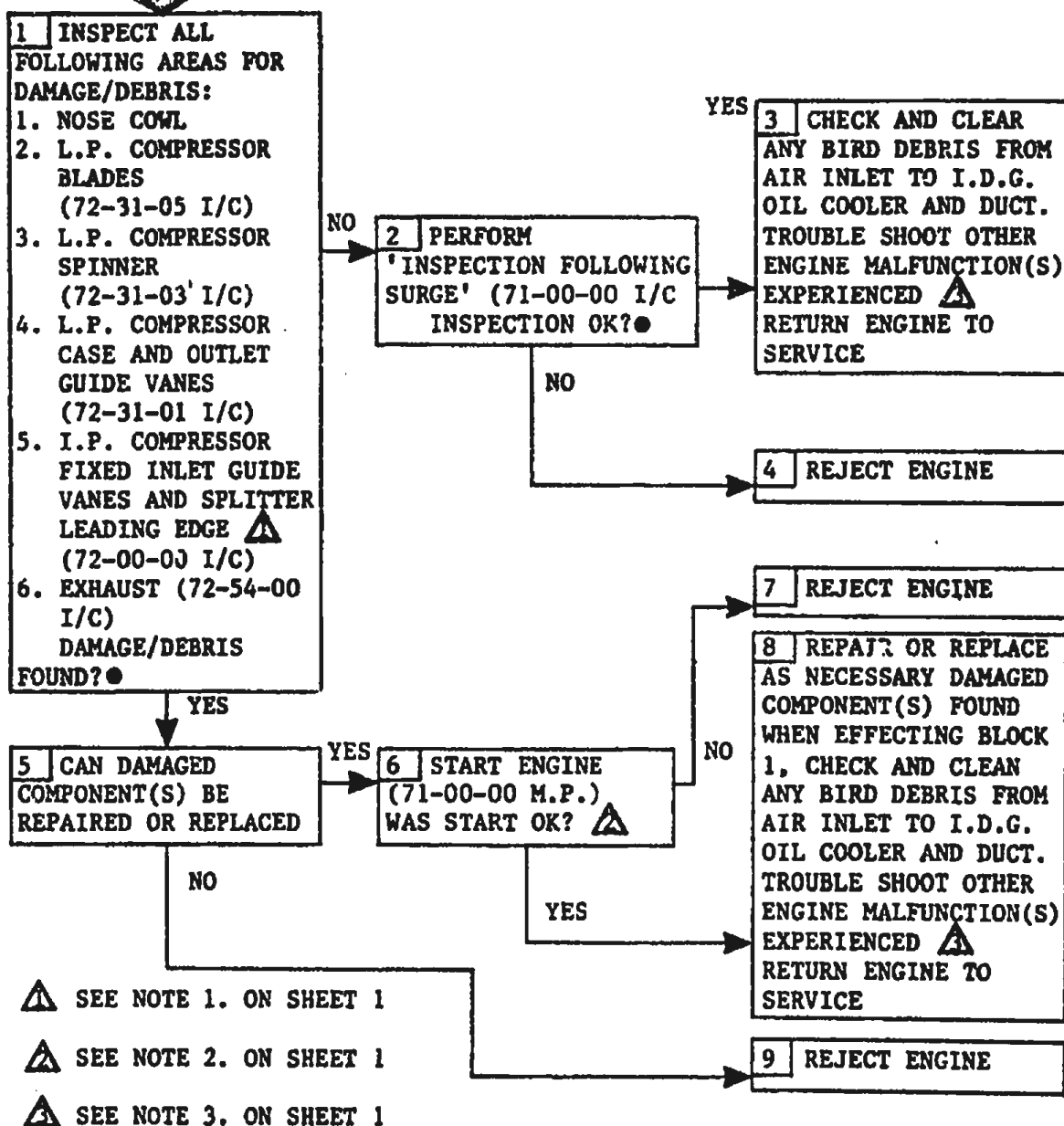
1T

71-99-00
Page 108
Jun 15/94



RB.211 Propulsion System MAINTENANCE

BIRD STRIKE/SUSPECTED BIRD STRIKE ACCOMPANIED BY ENGINE SURGE AND WITH OTHER INDICATIONS OF ENGINE MALFUNCTION



39899C

R
R
R

Bird strike/suspected bird strike, accompanied by engine surge and with other indications of engine malfunction
Fig.104 (Sheet 2)

EFFECTIVITY: ALL

050B

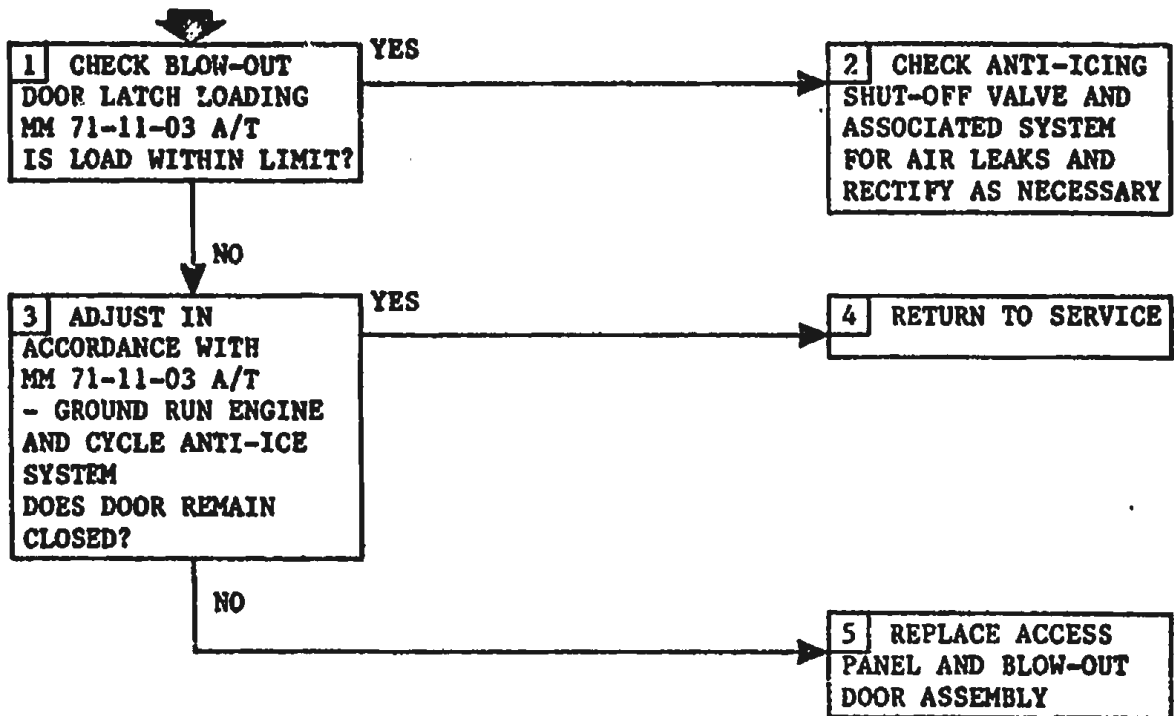
1T

71-99-00
Page 109
Jun 15/94



RB.211 Propulsion System MAINTENANCE

Nose Cowl - Thermal Anti-icing Blow-out door found open after flight, or following engine ground running



A2023

R
R
R

Nose Cowl - Thermal Anti-icing Blow-out door found open after flight or following engine ground running
Fig.105

EFFECTIVITY: ALL

050B

71-99-00
Page 110
Jun 15/92

1T



RB.211 Propulsion System

MAINTENANCE

B. Acceptance Standards

(1) Unit drains

Fuel pump assembly	(Fuel - Engine running	10 drops/min.
	(	(30 cc./hr. maximum)
	(Engine static	7 drops/min.
	(	(20 cc./hr. maximum)
	(Engine oil	1 drop/3 min.
	(	(1 cc./hr. maximum)
Fuel flow regulator	(Fuel - Engine running	10 drops/min.
	((See NOTE 1 and 3)	(30 cc./hr. maximum)
	(Engine static	7 drops/min.
	((See NOTE 2)	(20 cc./hr. maximum)
	(Engine oil	1 drop/3 min.
	(	(1 cc./hr. maximum)

- NOTE:**
1. A maximum engine running fuel leak rate of 300 cc./hr. is acceptable to enable an aircraft to proceed to a station where a F.F.R. change can be accomplished.
 2. If the engine static fuel leak rate is exceeded check the engine running fuel leak rate. It is acceptable for the static limit to be exceeded if the running limit is acceptable. The limits given above for Engine Static are with boost pumps switched off.
 3. With high fuel temperature or high outside air temperature, FFRs with the Cook VmO fuel seal installed, (SB 73-9339) (Lucas CP6761) may show excessive static fuel leakage. During engine running, the effect of the increase in fuel pressure can reduce this leak to an acceptable level. It is acceptable for FFRs with this leakage characteristic to remain in Service to allow the aircraft to proceed to a Station where an FFR can be replaced.

Hydraulic pump(s)	(Hydraulic oil	5 drops/3 min.
	(	(5 cc./hr. maximum)
	(Engine oil	1 drop/3 min.
	(	(1 cc./hr. maximum)

EFFECTIVITY: ALL

050B

1A

71-70-00
Page 206
Jun 15/96